ANALYSIS OF THE ADAPTATION OF THE RESPONSIVE TEACHING PARADIGM TO SERVE PREDOMINANTLY NATIVE HAWAIIAN COMMUNITIES:

A FRAMEWORK FOR GUIDING CULTURALLY APPROPRIATE, FAMILY-CENTERED, RELATIONSHIP-BASED EARLY CHILDHOOD SERVICES

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Dedication Page

Tämä väitöskirja on omistettu kauniille ja nerokkaalle vaimolleni. Rakkautesi, tukesi ja kärsivällisyytesi mahdollistivat tämän väitöskirjan valmistumisen. Tulee viemään paljon aikaa, että maksan takaisin kaiken, jota olet vuokseni tehnyt. Onneksi minulla on koko elämä aikaa.

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Abstract

Research shows early childhood is critical for establishing a foundation for overall development and future success (National Scientific Council on the Developing Child [NSCDC], 2012). Empirically supported early childhood services (ECS) are the most effective, efficient means of promoting lifelong success (Heckman, 2006). However, policies and resource allocation often do not adequately support such services, and there remains a large gap between what research tells us and what we actually do (Shonkoff, 2004; Young, 2013). This dissertation examines a program designed to address this gap by providing effective ECS based on themes and best practices extracted from what the literature tells us. Chapters 1, 2, and 3 explores the literature and the need for such services to serve predominantly Native Hawaiian communities on O‘ahu. They also describe the existing evidence that supports why Responsive Teaching (RT) was chosen as the paradigm used in the current study.

Project SPIRIT (Supporting Parents In Responsive Interactions and Teaching) used the themes and best practices of Chapter 2 to guide the adaptation and implementation of the RT paradigm and empirically answer the primary research question. Can the RT paradigm be adapted effectively to serve low-SES, predominantly Native Hawaiian communities on O‘ahu by strengthening caregiver-child relationships and improving the children’s cognitive, communicative, social-emotional, and overall developmental functioning. This study explored in Chapters 3, 4, and 5 implemented a naturalistic, before-and-after design to test whether the program could use the RT paradigm to improve developmental outcomes for children by promoting responsive interactions and enhancing caregiver-child relationships. This is the first to do so in naturalistic environments in predominantly Native Hawaiian communities and to include such diverse ability levels in the study’s sample. There is strong evidence that the children who

completed the program showed significant improvements in developmental outcomes across all domains. However, the correlational research design and the lack of a control group make it impossible to establish a causal relationship between the program procedures and developmental outcomes. The discussion of these details adds to both the existing RT related research and the general literature regarding the adaptation and implementation of ECS.

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List of Abbreviations

ABLLS	Assessment of Basic Language and Learning Skills
ABA	Applied Behavioral Analysis
ASD	Autism Spectrum Disorder
BDI-2	Battelle Developmental Inventory, 2nd Edition
CES-D	Center for Epidemiologic Studies Depression Scale
CSS	Change Sensitive Scores
DIR	Developmental, Individual-difference, Relationship-based
DOE	Department of Education
DTT	Discrete Trial Training
ECS	Early Childhood Service(s)
ED	Engaged Dropouts
FAP	Family Action Plan
IBI	Intensive Behavioral Interventions
PDD	Pervasive Developmental Disorder
PRT	Pivotal Response Training
RFI	Relationship-Focused Intervention
RT	Responsive Teaching
RTC	Responsive Teaching Curriculum
SD	Standard Deviation
SES	Socioeconomic Status
SPED	Special Education
SPIRIT	Supporting Parents In Responsive Interactions and Teaching
TD	Total Dropouts
US	United States

CHAPTER 1

INTRODUCTION

Project SPIRIT (Supporting Parents In Responsive Interactions and Teaching) was funded by a grant from the Federal Department of Education's Native Hawaiian Programs Act. The program addressed the substantial need for evidenced-informed services to help local children from birth to five-years-old who have or are at-risk of developmental delays in one or more of the following domains: Cognitive, Communication, Social-emotional, or Overall. Thus, it was imperative to carefully choose an evidenced-informed paradigm, design effective delivery and data collection methods, and empirically explore all outcomes and limitations to add to the existing literature related to both the specific service paradigm and general early childhood service (ECS) delivery procedures.

The Responsive Teaching (RT)[1] paradigm which includes a specific curriculum (RTC) and a methodological approach to service delivery (see Abbreviations and Definitions page for more detail) was chosen because it is built upon a solid theoretical foundation backed by data tested through the peer-review process on several occasions (Karaaslan, Diken, & Mahoney, 2011, 2012; Kim & Mahoney, 2005; Mahoney, Boyce, Fewell, & Spiker, 1998; Mahoney & MacDonald 2007; Mahoney & Perales, 2005; Mahoney & Powell, 1988; Mahoney, Robinson, & Powell, 1992; Mahoney, Wiggers, Nam, & Perales, 2014). However, it had never been adapted to serve, low-SES, predominantly Native Hawaiian communities on O'ahu, the population of this

[1] Note: Responsive Teaching is both a specific curriculum and general approach for providing ECS. Thus, it is most often referred to in this dissertation as the "RT paradigm" or simply "RT" which includes both the curriculum and relationship-based approach that focuses on promoting responsive interactions to enhance pivotal behaviors to increase developmental outcomes. At times, the word "curriculum" or "RTC" is used to refer to the curriculum components specifically and "approach" is used to refer to the general approach to service delivery.

study. Furthermore, the approach of this study challenges the normative implementation of RT that typically includes samples of children with a specific diagnosis (e.g., Autism Spectrum Disorders [ASD], Pervasive Developmental Disorders [PDD], Down syndrome) or a pronounced developmental delay as will be discussed in Section 2.5. Project SPIRIT also included those children, along with some with mild to moderate delays and others who were at-risk because of environmental factors. Services were provided in the children's communities and naturalistic environments. The researcher knew there would be difficulty evidencing cause-and-effect inferences with this type of design but chose to prioritize increasing access to services for low-SES communities with limited resources who often have difficulty accessing such services (Johnson, Brown, Chang, Nelson, & Mrasek, 2011).

This dissertation uses a before-and-after design to not only explore the specific outcomes for children and families completing services, but also to describe and discuss the process and limitations that are of concern for naturalistic applications of research-based paradigms. In doing so, this dissertation adds to the existing research regarding general approaches towards ECS and addresses several important gaps or conflicts pertaining to specific methodological approaches in service delivery. As the first to do so, this study provides evidence, insights, and limitations that may be important for future service provision and research when adapting the RT paradigm to predominantly Native Hawaiian communities on O'ahu. As will be discussed, this study is also the first to apply this paradigm to a cohort with diverse ability levels and needs; including those within at-risk environments (see Mahoney and Nam. 2011 for summary). This is important because at-risk infants and toddlers, those not yet diagnosed, or those with mild to moderate delays are often in danger of not receiving the type of ECS that can substantially improve developmental trajectories (Johnson et al., 2011) as will be explored in the literature review.

In Sum, the substantial evidence supporting the efficacy of the RT paradigm will be explored in this dissertation. Some of the evidence is obtained from peer-reviewed publications directly using the RT paradigm. However, the current study is applying this paradigm to new populations and environments. This dissertation will also explore general principles and findings that evidence the fundamental principles underlying the RT paradigm and support the prediction that it could be adapted to serve the populations and environments encapsulated within this original study. Adaptation, an important and complex process, can be a barrier in implementing curriculums and paradigms from one culture or environment to another. Chapter 2 will explore these issues to bridge the gap between research and application of effective ECS. It is not a traditional literature review, but one that collates a wide breadth of transdisciplinary research to extract themes and best practices helpful for implementing or adapting ECS across contexts and populations (see Chapter 2 for concise list of themes and best practices). Research findings specific to the RT paradigm will be embedded within these themes and best practices as both evidence of its existing empirical support and of the plausibility of adapting it effectively to the variables within the current study. The review outlines empirically-derived themes and practices that will not just help in understanding the current study, but also be a useful guide for the delivery of future ECS.

Section 1.1: Research Problem, Background, and Context

Research shows that early childhood is critical for establishing a foundation for overall development and future success (NSCDC, 2012). Never again in the lifespan will growth and development occur at such a rapid pace (Phillips & Shonkoff, 2000). Empirically supported early childhood services are the most effective, efficient means of promoting lifelong success (Heckman, 2006; Mahoney & Perales, 2005). However, policies and resource allocation often

do not adequately support such services, and a large gap remains between what research tells us and what we actually do (Shonkoff, 2004; Young, 2013).

Unfortunately, the gap in Hawai‘i is even greater, especially for the low-socioeconomic status (SES), predominantly Native Hawaiian communities served by Project SPIRIT (Johnson et al., 2011). Hawai‘i is among only 11 states not to have state funded preschools, and the state cut funding for ECS in 2012-13. This was after previous cuts in state funding in 2009 when eligibility criteria was removed that allowed services to be provided for children defined as “environmentally at-risk” (Johnson et al., 2011). The state has also narrowed eligibility criteria for children biologically at-risk (Johnson et al., 2011) even though the Hawai‘i Special Education Advisory Council (2013) “provided strong opposition to the plan to limit eligibility for infants and toddlers with milder delays, asserting these children will be harmed by a lack of [services]” (p. 6). Providing evidenced-informed services to help the most at-risk and those that may benefit most is a clear a problem that is addressed by this research.

Project SPIRIT helped to fill the critical need of evidence-informed services by providing a home and community-based program to help children and caregivers engage in the responsive interactions that build a vital foundation for optimal development and lifelong success. Responsive, supportive parenting practices are associated with the development of important competencies such as social interaction and self-regulation skills (Bradley, & Corwyn, 2007; Lengua, Honorado, & Bush, 2007; Tobin, Sansosti, & McIntyre, 2007). Furthermore, responsive parenting builds a strong foundation for facilitating overall development of young children’s social, emotional, communication, and cognitive domains (Landry, Smith, Swank, 2006; Landry, Smith, Swank, & Guttentag, 2008).

However, not all families employ responsive parenting practices. Low education and SES correlates with less effective parenting practices, negative impacts on children’s overall

development, and decreased school readiness (Mahoney & MacDonald, 2007). Research has shown that children's cognitive and communication development correlate with SES and that children from low-SES families are at a significant disadvantage (Fernald, Marchman, Weisleder, 2013; Hart & Risely, 1995 and 2003). By 18-months, there are "striking" disparities in early language proficiency, language processing, and vocabulary for children in low-SES environments (Fernald, Marchman, Weisleder, 2013). By four-years-old, these disparities continue to widen dramatically and low-SES children are estimated to experience approximately 30 million fewer words (Hart & Risely, 1995 and 2003). It is not just the number of words they experience that is the problem. These children also experience approximately 560,000 fewer instances of encouraging feedback and 125,000 more discouragements (Hart & Risely, 1995 and 2003). The rates of depression and harsh parenting are particularly high among parents who struggle with the multiple stressors associated with poverty (Mahoney & MacDonald, 2007). This is important because the poverty rate is nine points higher than the 22.8% state average for Native Hawaiian families with children under five-years-old (Kamehameha Schools, 2009b). Hawaiian children are less likely to attend preschool and more likely to come from low-income families (52%) and receive free or reduced lunch (59%) (Kamehameha Schools, 2009a and 2009b). Children in the predominantly Native Hawaiian communities we identified represent those most at risk because fewer than 50% of their families are able to afford center-based preschool or other early childhood services (Kamehameha Schools, 2009b). In turn, 60% fail to show skills necessary for school success when they arrive in kindergarten and 52% lack necessary social-emotional and self-regulation behaviors and skills (Kamehameha Schools, 2009b). Kana'iaupuni, Malone & Ishibashi (2005) report the achievement gap between them and other students continues to increase and cite these concerns: 1) Native Hawaiian communities

have the highest incidence of single-parent families with minor children; 2) their children are more likely to report conflict within their families, and statistics show child abuse and neglect are more common (Johnson, Kuriyama, & Magnier, 2014); and 3) Native Hawaiian families with children have the lowest mean income and highest poverty rates of the major ethnic groups. There is an obvious need in predominantly Native Hawaiian communities. This dissertation outlines how the RT paradigm was adapted to serve these communities by providing families with culturally sound, relationship-based support of positive parenting practices that enhance caregiver-child relationships and support child development.

Section 1.2: Research Questions, Theoretical Framework, and Dissertation Components

This dissertation outlines the methodology used to address important needs of local communities and how the research paradigm addresses gaps and controversies in the literature. The literature review in Chapter 2 explores existing theories, controversies, and data to extract themes and best practices useful for guiding the implementation of effective ECS like that in the current study. This exploration helps synthesize multidisciplinary, sometimes contradicting research that can be difficult to collate and digest for ECS professionals. As the themes and best practices are detailed in Chapter 2, findings related to the RT paradigm will be intertwined as evidence that it is built upon a foundation of empirical evidence and sound theory (Mahoney & MacDonald, 2007). This is a critical step for answering the primary research question of Project SPIRIT. Can the RT paradigm be adapted to effectively serve low-SES, predominantly Native Hawaiian communities on O‘ahu by strengthening caregiver-child relationships and improving the children’s cognitive, communicative, social-emotional, and overall developmental functioning? The study hypotheses are stated below.

1) The developmental trajectories of children who complete the program would significantly improve;
2) Program completion would promote responsive caregiver-child interactions;
3) High levels of depression would negatively correlate with program effectiveness;
4) Caregivers who complete the program would report stronger relationships with their child, enhanced parenting and teaching skills, inclusion of their cultural values, and overall satisfaction with the program.

As will be explored according to themes and best practices, RT is designed to strengthen family relationships and help young children develop critical cognitive, communicative, and social-emotional skills. It is derived from the latest findings from diverse child development research (Bailey, 2001; Hirsh-Pasek, Golinkoff, & Eyer, 2003; Landry et al., 2006). As explored in Section 2.4, RT is built on substantial evidence for family-centered, relationship-based approaches (Bailey, Raspa, Sam, & Humphreys, 2011). Research shows this approach helps caregivers interact responsively within everyday routines to strengthen relationships and enhance development and well-being (Karaaslan, et al., 2011; Kim & Mahoney, 2005; Mahoney, et al., 1998; Mahoney, & MacDonald, 2007; Mahoney & Powell, 1988). Although valid data exist supporting the efficacy of the RT paradigm (Karaslan et al., 2011 and 2012; Kim & Mahoney, 2004, 2005; Mahoney & MacDonald, 2007; Mahoney & Perales, 2003; Mahoney et al., 2006; Mahoney, Wiggers, Nam, & Perales, 2014), it has never been used in Hawai‘i or within predominantly Native Hawaiian communities. However, it has been adapted successfully to serve Korean (Kim & Mahoney, 2004, 2005) and Turkish (Karaslan et al., 2011, 2012) populations outside the continental US (see Sections 2.4 and 2.5). As the literature review in Chapter 2 explores in more detail, the RT approach is based on existing developmental, learning,

and service delivery theory and data making it possible to be adapted to the specific populations and contexts served by SPIRIT. This is the first research to explore this prediction and thus adds important data to the existing research.

CHAPTER 2

LITERATURE REVIEW

The future of any society depends on its ability to foster the health and well-being of the next generation. … [B]etter public understanding of the rapidly growing science of early childhood and early brain development can provide a powerful impetus for the design and implementation of policies and programs that could make a significant difference in the lives of all children (National Scientific Council on the Developing Child [NSCDC], 2007a, p. 1).

Professionals from many fields explore factors necessary for children to grow, learn, and develop. Such factors transverse multiple disciplines, but early childhood remains a primary focus. This period is critical for establishing a foundation for overall development and future success (NSCDC, 2012). Growth and development happen not in a vacuum but within a family and environmental system. Relationships and stimuli provided by the network of people surrounding a child help them survive and thrive (NSCDC, 2004b). This is not only true for physical development, but also for the cognitive, social-emotional, and communication domains emphasized in the current study. Nurturing and responsive relationships create the framework needed for children to reach their full potential. Supportive networks are vital for children with developmental delays or at risk of falling behind because of environmental or biological factors (NSCDC, 2004b). In fact, absence of such relationships can itself be the environmental at-risk factor that causes or exacerbates developmental delays (Center for the Developing Child at Harvard University, 2012).

There is a long history of theory and research from many disciplines regarding foundational practices best for educating and helping young children. However, summarizing and applying such varied data is often problematic, yet imperative for the effective design and implementation of services like SPIRIT. Professionals from different fields must work cohesively in a system based on findings that transverse many disciplines. Transdisciplinary theory and data regarding how all children develop should be the foundation upon which to base all ECS.

However, ECS procedures and policies often do not adequately reflect research findings. As Shonkoff (2004) puts it: although "[t]he notion of 'starting earlier' to make sure that more young children arrive at school eager to learn is gaining momentum, … there remains a staggering gap between what we know and what we do as a society when it comes to early care and education" (para. 1). If these data exist, why does this gap emerge upon application of ECS? The first major reason is that service professionals and families often do not fully comprehend the impact of quality interactions and stimulation on brain development in the early years of a child's life. Thus, Section 2.1 summarizes applicable neuroscientific data evidencing why this is true and precisely how the early years build the foundation for lifelong success. A general knowledge of this allowed the program's home visitors to help caregivers understand the importance of program objectives and to motivate them to engage in the interactive process. Because "real world" application of the existing research was paramount to this research, examples drawn from the literature, the current study, and professional experience are intertwined throughout this review to help clarify the themes and best practices explored in this dissertation. This is important because the second major reason for the gap in what we know and do is the need to synthesize fundamental theories and models for viewing overall development

and basing ECS. Without this, theories and data are often overwhelming, convoluted, misinterpreted, or overgeneralized. Thus, Section 2.2 synthesizes multidisciplinary research and theory to help clarify a systems-based framework for viewing overall development and basing efficacious, transdisciplinary services such as the program used in this research. Careful inclusion of diversity is a constant theme and best practice in and of itself. Thus, we not only consider children with diverse abilities and needs throughout this review, but Section 2.3 explores culture as a ubiquitous theme paramount for the effective implementation and adaptation of all ECS. The purpose of this literature review is not just to explore data related to RT, but also to outline empirically derived, generalizable themes and best practices for helping all young children reach their own full potential. These are what guided the selection and adaption of the RT paradigm used in the current research as will be explored according to each theme and best practice.

The final major reason for the gap between what we know and what we do is that theoretical concepts must be actionable and applicable to the "real world." Those of us experienced in both realms must help bridge this gap between theory and application. Section 2.4 builds upon the generalized themes outlined in the first three sections, and it adds specific best practices for the application of effective early childhood programs like SPIRIT. An exploration and comparison of phenomena, data, and controversies in service delivery methodologies elucidate why certain approaches, practices, and curriculum components are deemed best. The RT paradigm (Mahoney & MacDonald, 2007) used in the current study is evidenced to be an exemplar for service delivery as evidenced throughout this review. In turn, the themes and best practices elucidated in this review were used to ensure the RT paradigm was being used appropriately to serve the particular participants in the current study. Therefore, the literature

review is sectioned to follow and outline the theories and data that evidence the following general themes (1-3) and applied best practices (4-6) upon which to guide ECS programs, as they were in Project SPIRIT.

1. Early childhood is a critical period in which services must be provided to help lay the foundation upon which a child will grow and thrive (Section 2.1).
2. Early childhood services must consider the transactional, bioecological, and cultural" systems in which children grow and learn (Section 2.2).
3. Culture is ubiquitous throughout this system and must be carefully considered when designing programs or implementing services (Section 2.3).
4. Early childhood services should use a strength-based approach to include, empower, and permeate the family system surrounding the child in need (Section 2.4.1).
5. Early childhood services should use a relationship-based approach that build on existing relationships using play and other routine activities to help the child grow and learn (Section 2.4.2).
6. Responsivity is a key component to attachment, parenting, and learning that should be addressed in early childhood services (Section 2.4.3).

The best practices above, especially 4-6, are not without controversy nor are they the basis of all early childhood service paradigms. Section 2.4 of this literature review explores existing data to address disagreements in the literature and support practices 4 - 6. Along the way, RT is evidenced to be an exemplar of these best practices, and the findings of existing RT related research will be explored within the section to which it pertains. RT was chosen because of this and because it emphasizes individualization to a particular child and family. Not only does this reflect the best practices described in Section 2.4, but it also allowed adaptations based

on the themes of Sections 2.1 and 2.2. The process of these adaptations will be explored in Sections 3.3 and 3.4 of the Methods chapter with references that will guide the reader to the pertinent sections of Chapter 2. Applying robust, transdisciplinary research across diverse populations and contexts is a complex, sometimes overwhelming, process. There is no way to address all variables or develop a "one-size-fits-all" framework for providing ECS. The purpose of this dissertation is to provide empirically derived themes and best practices to consider when developing and implementing ECS programs. Although the current study chose to do so using the RT paradigm, it does not assume this the only one that can be used to help young children. The current study tested whether RT could be adapted adhering to the themes and best practices in this review to effectively serve predominantly Native Hawaiian communities on O'ahu. Themes, practices, procedures, findings, and limitations discussed here may help other programs serve young children effectively whether using the RTC or another based on the themes, practices, and findings outlined in this dissertation.

Section 2.1: The Importance of Reaching Children Early

> *The explosion of research in neuroscience and other developmental sciences highlights the extent to which the interaction between genetics and early experience creates either a sturdy or weak foundation for all the learning, behavior, and health that follow (NSCDC, 2007a, p. 1).*

Although transdisciplinary research converges upon the widely accepted fact of the importance of the pre-school years, not enough people clearly understand exactly why and how to explain this concisely to others, and this has negative implications on policy and practice. Development in these years is rapid and lays an essential foundation for lifelong development (NSCDC, 2007a, 2008, 2012; Phillips & Shonkoff, 2000). Reaching children early is the most

effective means of helping all children reach their full potential, especially those at-risk or with special needs (Heckman, 2006; Mahoney & Perales, 2005; Young, 2002). However, the actual policies and procedures related to ECS often do not reflect this widely accepted best practice (Shonkoff, 2004; Young, 2013). This is a serious problem globally and locally, creating the need for programs like SPIRIT to provide both effective services and reliable data (Engle, Black, Behrman, Cabral de Mello, Gertler, Kapiriri, & Young, 2007). If families, professionals, and policymakers more clearly understood early brain development, perhaps policies and practices would more aptly reflect what the research clearly evidences. Simply, it is a universal truth that the early years from birth to five-years-old represent a "sensitive period" in development (NSCDC, 2007b). Children's experiences with rich environmental stimuli and relationships are crucial to both their optimal development at those "stages" and for the rest of their lives (NSCDC, 2012).

A general understanding of the process of early brain maturation also helps practioners and caregivers view a child through a developmental lens, which helps to provide age-appropriate expectations, experiences, and tasks. This was a critical component in the success of SPIRIT. The RT paradigm was used to prompt caregivers and professionals to meet children where they were developmentally (Mahoney & MacDonald, 2007). If a child's neural circuitry and experiences have not yet interwoven to prepare them for a particular skill or expectation, caregivers and professionals are using time and resources inefficiently, at best. At worst, they may be adding unnecessary stress that may abate healthy brain development (NSCDC, 2007b).

A developmentally appropriate lens is even more important for those working with children with or at-risk of having developmental delays. For example, chronological age does not always determine age-appropriate skills and experiences. One must begin with an individualized

assessment of a child's developmental age (i.e., the age at which she is functioning) as we did in Project SPIRIT (see Section 3.3). However, disorders may affect a particular domain or skill (e.g., apraxia or dyslexia) or be characteristic of splintered skill sets (e.g., ASD, Asperger's syndrome). Children often encounter tasks, interactions, and expectations beyond their overall or domain specific developmental age. It is imperative for caregivers and professionals to understand this and use a developmentally age-appropriate perspective to guide interactions and services. Using neurological research to prompt people to think developmentally helps them understand that a child's needs, skills, capabilities, and neural circuitry change across time and contexts. This promotes more effective, developmentally appropriate services and interactions.

Section 2.1.1: Neurological development and early sensitive periods. The first five years of life, especially birth to three, is a period of initial and rapid growth of brain architecture. A newborn's brain is about 25% of what it will weigh as an adult. By the age of three-years-old, it will reach 80% of its adult size and 90% by the age of five (Phillips & Shonkoff, 2000). A dramatic increase and proliferation of the neural circuitry that drives learning and behavior also occurs during this period. A newborn has over 100 billion neurons that quickly begin synapses, propelled by genetic unfolding combined with environmental experiences. For example, each neuron has approximately 2,500 synaptic connections at birth and increases to approximately 15,000 between the ages of two and three (Phillips & Shonkoff, 2000).

The brain produces many more synapses than needed and then prunes unused ones. The number of connections and networks in a child's brain peak around age three for most of the brain. Then, they begin rapidly decreasing, stabilizing near adult levels between ages four and five (Phillips & Shonkoff, 2000; Rakic, Bourgeois, Eckenhoff, Zecevic, & Goldman-Rakic, 1986). Caregivers and professionals must understand the interactions children have with people

and stimuli surrounding them drives synaptic pruning. Used pathways are strengthened. Those not used or effectively stimulated because of biological impairments, environmental deprivation, or lack of responsive interactions are pruned.

It is important to understand how this section is not just one of theory but one critical in application as well. In the current study, these vital concepts were continuously emphasized to both professionals and to caregivers. Several of these specific examples and statistics were deliberately included throughout the entire program. From the moment participants read our brochure or spoke to a team member, these concepts were used to motivate them to pursue services that may help their child as early as possible and to overcome a "wait and see" approach. Once engaged in our program, home visitors were trained to explore early brain development with participants to help them concretely "see" how responsive interactions and other program strategies were shaping the architecture of their child brain and building a foundation for future development. This was designed to help motivate participants to engage in program objectives, to sustain them upon program completion, and to empower them to feel that they could be active agents in promoting their child's progress and development.

Section 2.1.2: Neurological development, interactions, and culture. Synaptic pruning universally affects all domains in both typical and atypical development but is moderated by culture. For example, typically developing infants can make all sounds in all the world's diverse languages, a species-specific cognitive constraint (Arnett & Maynard, 2013). So, why do we have culturally specific accents? Why is it difficult for adults to produce some sounds in languages different from their own? A child mostly interacts with those from his own culture, hearing and producing those particular sounds. As this occurs, that particular circuitry strengthens and the unused patterns related to languages not consistently presented in their

environment get pruned (Phillips & Shonkoff, 2000). This specific example was one I found extremely useful to help caregivers and professionals understand this phenomenon and how it manifests in everyday life to motivate them to engage in our study's interactive, caregiver-mediated process.

The same process occurs throughout all domains, including behavioral regulation and socio-emotional development. Simply, the brain needs environmental stimulation and experiences to build its architecture properly. Thus, neglect or deprivation of sensory, socioemotional, or cognitive stimulation can be just as damaging as trauma or teratogens to healthy neural circuitry formation (NSCDC, 2005, 2007b, and 2010). This fact is important for understanding why ECS are imperative for children with developmental delays and disorders or at-risk because of impoverished environments. It was also a useful one in the current study because it helped home visitors convince caregivers why the simple daily routines and interactions emphasized by the RT paradigm were so important. It helped them increase the caregivers' motivation to engage in more of the responsive interactions that were the crux of program success.

The growing body of neurological research indicates that children with developmental delays or in at-risk environments are even more in need of programs like SPIRIT. First, domains and skills are highly interwoven, and a deficit in one domain or skill may affect another. It can also prevent the child from receiving input necessary for another domain to develop normally. For example, most deaf children are born to hearing parents (Gargiulo, 2011). If these children do not receive the necessary linguistic stimulation and feedback, their language and communication abilities may be delayed. However, when deaf children are born to deaf parents fluent in sign language, they progress through normative stages of language development at rates

similar to average infants with no hearing loss (Gargiulo, 2011). This emphasizes the importance of early environmental experiences and the notion that skills beget skills (Heckman, 2006). That is, the brain develops via a hierarchical architecture. Higher order skills and structures are built by and upon previous experiences and structures and circuitry (NSCDC, 2007b; Phillips & Shonkoff, 2000).

The previous example also alludes to the importance of reaching a child early during the sensitive periods of domain or skill development. The uniquely rapid proliferation and pruning in the early years is a double-edged sword. It allows for amazing progress as seen in the rapid progression of language development in the first few years of life. The plasticity of neural connectivity and active molecular and chemical inputs allow for such learning and adaptation (NSCDC, 2007b). However, rates of growth and activity slow dramatically after these sensitive periods (NSCDC, 2012). Understanding this is vital for promoting effective early childhood policies, programs, and procedures. The current study promoted this understanding to help caregivers and professionals avoid the "wait and see approach" driven by fear or misinformation. We often heard the common objections that children may just "grow out of it" or fear of labeling and stigmatizing their child early in life. Furthermore, they could be missing important input and stimulation along the way. Home visitors were trained to use the research summarized in this section to explain to participating families the proven best practice of engaging in non-invasive ECS as early as possible. Many participants report hearing the "wait and see" advice from their medical doctor, elucidating the need to close the gap between what research shows and what may be recommended.

In such cases, we were careful to explain a related fact from the maturing brain literature. Brain maturation does modify brain architecture and capabilities and there are different

trajectories to similar developmental outcomes. Thus, some children may "grow out of it" without specified treatment if parents choose to "wait and see." However, some will not. Thus, we explained to parents that it is better to perform non-invasive treatments such as RT then to risk a "wait and see" approach. We explained that if they were going to "grow out of it," then we would simply help them get there quicker and build a solid foundation along the way. If they were not going to "catch up" naturally, then we provided critical services during a sensitive period. We used "sensitive" and not "critical" to describe these periods because the window is closing, but it does not slam shut. The brain typically continues to grow neurons and retain plasticity across one's lifespan, but not nearly at the same rate or effectiveness as within the sensitive periods of early development (Phillips & Shonkoff, 2000). Practically, this gives caregivers and professionals hope that all is not lost if you do not reach a child early enough or if they experience trauma later in life. This fact is empirically true. However, intervening later in a child's life is not as effective or cost efficient as doing so early (Heckman, 2006; Mahoney & Perales, 2005; Young, 2002).

Furthermore, it is harder to "undo" neural circuitry or "reprogram" the brain once behavior patterns have been established (NSCDC, 2007b). This fact is practically useful, especially when dealing with mild delays or within prevention programs or those at-risk. For example, one Project SPIRIT participant had a three-year-old grandson who was displaying behavioral problems at home and in group environments. His BDI-2 (Newborg, 2005) scores indicated self-regulation skills below average but not clinically so. She expressed that "he's just growing out of the terrible twos stage," and she just needed some help with disciplining. I needed her to commit to our program so we could help her interact and react in a responsive manner in order to change the root cause of the problem behaviors. I accomplished this by explaining the

importance of this sensitive period and that it would be harder to "undo" if we waited or just reacted to the symptoms. This example shows how the literature summarized in this section was used practically in the current study to establish and communicate the best practices of helping children as early as possible.

Section 2.2: Development as an Interconnected System

Each of us is the product of an ongoing interaction between the influence of our personal life experiences and the contribution of our unique genetic endowment, within the culture in which we live (Shonkoff, 2004, p.1).

This section synthesizes theories and data necessary for viewing child development, and family/cultural systems while considering the variables and interactions important for guiding ECS. A myriad of fundamental theories and empirically supported evidence exist. However, the data can be difficult to navigate and implement for those who focus more on everyday application. Evidence can also be or seem to be contradicting at times. This can lead to confusion or misinterpretation by often overworked, undertrained professionals serving young children and their families.

The biological and neurological facts explored in Section 2.1 show the importance of early childhood. However, these findings must be considered within the overall dynamic system in which the child exists. A systems viewpoint paints an overall picture of what it means to develop and the many interwoven factors of influence. This perspective helps determine which components within a particular child or environment to access or manipulate to promote optimal development. It is inefficient or even futile to respond only to specific symptoms or skill deficits in isolation, blind to the intertwined variables that are related or even causing them. The first step

toward avoiding such futility is viewing human existence and development as a dynamic system (Thelen, 2005; Thelen & Bates, 2003). This theory frames holistic development as a continuous and multidetermined process (Thelen, 2005). This view supports the best practices in Section 2.4 that emphasize a relationship-based, family-centered approach that promotes responsive interactions to enhance relationships and behaviors fundamental to development, not discreet skills in isolation.

Systems theories evolved as psychology and child development research matured and merged with other disciplines. Attempting to be more "scientific," experimental variables were isolated and environments controlled by segmented, specialized professionals. Scientists learned human existence and development are far too multifaceted and interconnected for such strict controls. Furthermore, interactions between these complex levels and variables (e.g., biology, environment, behavior) are as vital as the individual components themselves (Sameroff & Fiese, 2000; Thelen, 2005). Simply, the whole is not always reducible to its pieces or a linear summation of its parts. Furthermore, overly segmented ideologies led to overly rigid or deterministic explanations. Historically, strict behaviorists once minimized the role of one's own biology, and equally extreme nativists once overlooked the continuously influential role of experience. Such extreme viewpoints are incomplete and ignore the vital interactions between influences on development and behavior. They often ignore influences of relationships, context, and culture on developmental trajectories as well. In the current study, it was imperative to train home visitors to view development and program procedures through a dynamic system lens to avoid such issues.

The Bioecological Systems Theory (Bronfenbrenner, 1994) is a seminal model that constructs a functional systems perspective of development. Professionals and caregivers can use

this model to develop a comprehensive perspective without having to be an expert. It represents actionable knowledge both theoretically and practically useful. Bronfenbrenner first developed his “Ecological Systems Theory” to depict environmental layers that create the context and relationships within which a child develops. He renamed it the “Bioecological Systems Theory” to emphasize the active role a child’s own genes and behaviors play in development and their influences on other environmental variables. Continuous, bidirectional transactions between all system components and layers are paramount to systems theories such as this (Sameroff & Fiese, 2000). These interactions between a child’s own biological maturation and his or her family, community, society, and culture propel and guide developmental trajectory. Input or changes to any component ripples throughout the entire system (Thelen, 2005; Sameroff & Fiese, 2000). To study or assist a child’s growth or learning, one must consider all intertwined variables and interactions within the child, family, and environment. Because of this concept, an important theme throughout the design and implementation of SPIRIT was to consider the “variety of methods [needed] to explore the contexts of development in order to understand developmental processes rather than focusing simply on variables under question” (Maynard, 2005**,** p. 41).

This concept drove many of the decisions we made to adhere to naturalistic contexts and include family system variables. While these decisions enhanced program effectiveness, they weakened “experimental control” as related to traditional research designs and methodologies. While these scientific processes and methodologies are important, this section describing the system of variables that applied programs must consider indicates that a balance must be struck. Although one must adhere to a sound, rigorous approach, it is simply not possible to isolate and control all the variables involved in family-centered, comprehensive programs like SPIRIT. Furthermore, considering a variable in isolation outside of the encompassing system is not a best

practice even if possible for the reasons delineated in this section and throughout this review. Thus, one must strive to be as empirically sound as possible but not reduce program effectiveness or reach simply to pander to the illusion of complete experimental control when dealing with child and family systems. However, applied researchers must also be cautious of the implications they draw from results because of these methodological issues. Understanding this balance is necessary to bridge the gap between research and application. In the current study, this is exemplified by both the impressive developmental outcomes and the difficulty implying cause-and-effect connections linking the outcomes to the program. I believe this to be one reason for the gap between the research-based and applied fields, especially when a program is attempting to access family systems in naturalistic environments. Perhaps this is why naturalistic approaches are often championed, yet a search of peer-reviewed journals finds "a paucity of articles looking at outcomes for services provided in natural environments" (Johnson et al., 2011, p. 10). Thus, the discussion of both the successful outcomes and limitations of Project SPIRIT will add important findings to the existing literature and help to fill this gap.

Section 2.3: Cultural Ubiquity

The importance of understanding the influences of cultural macrosystems cannot be overstated. Students and professionals often oversimplify culture as a singular construct. However, it is a dynamic one constructed of many evolving sub-groups. To use Bronfrenbrenner's model properly, one must understand that cultural macrosystems surround and permeate each layer and component of the entire system. Culture embodies "belief systems, bodies of knowledge, material resources, customs, lifestyles, opportunity structures, hazards, and life course options that are embedded in each of these broader systems" (Bronfenbrenner, 1994). Simply, culture is everywhere and moderates all aspects of a child's development.

Maynard (2012) presents a mental exercise, elucidating this theoretically and practically significant perspective. She asks what is most important to provide an infant. Inevitably, responses fall along the bottom levels of Maslow's (1943) hierarchy of needs (e.g., food, shelter, warmth, love, etc.). While needs related to the top half of Maslow's hierarchy (e.g., self-actualization) are more obviously mediated by culture, one discovers the more basic ones are as well. Maynard (2012) concludes that culture creates the framework providing all the child's needs. Cultural influences permeate throughout all the layers surrounding and within the developing child. She summarizes eloquently that "culture provides the scripts and pathways for development, and understanding culture helps us understand what's universal and what's variable in developmental phenomena all over the world." I used this mental exercise with each of the home visitors to help them to view culture appropriately as we work together to avoid a "one-size-fits-all" approach.

It is a best practice to view culture as an overarching and intertwined set of constructs that bidirectionally influence all aspects of development. As such, a child's developmental trajectory follows universal patterns via cultural pathways (Greenfield, Keller, Fuligni, & Maynard, 2003). All humans have certain universal tasks and needs as they grow, such as forming relationships and acquiring knowledge (Greenfield et al., 2003). Humans share an evolutionary history that shaped developmental proclivities (Fiske, 2000) and species-specific constraints (Dasen & de Ribaupierre, 1987). However, these shared adaptations progressed through increasingly divergent pathways and ecocultural paradigms. Fiske (2000) sums this balance between universal development and cultural pathways perfectly. He explains that developmental "proclivities have no adaptive value without the [cultural] paradigms, and the paradigms have no meaning without the proclivities. They are co-adapted to function together"

(p. 82). Thus, one cannot determine what developmental variables are important or how to "help" a child without considering the cultural and contextual environment for which they are adapted to function. It was for these reasons that the current study provided services embedded within naturalistic family and cultural contexts. Furthermore, RT is designed to be a caregiver-mediated paradigm in which the home visitors individualize the curriculum to the needs and desires of the families. This principle made it easier to adapt to the cultural and family system variables of a particular family, which is one reason the research predicted it could be adapted to serve a new population.

Maynard and Greenfield (2003) provide an elegant example of how universal developmental progressions are embedded within cultural systems. The researchers observed Zinacantec Maya children and parents evidencing an implicit cultural model of using and prompting the use of certain tools. They hypothesized this model corresponded with the maturational readiness explicit in Piagetian stages deemed "universal." Maynard and Greenfield (2003) chose a classic knot pattern task Piaget used to explore concrete operational processes and predictions. The Maya children did not perform as generally predicted on the decontextualized task so they created an analogous task contextualized within traditional weaving practices. Importantly, they delivered both versions of the task to the Maya children in Chiapas, Mexico and to a paired sample of American children in Los Angeles. The Maya children performed as predicted by Piagetian theory when the task represented their own contextualized (i.e., weaving) cultural learning. The American children performed as predicted on the classic, decontextualized (i.e., knot patterns) task but not in the weaving task. Interestingly, short-term training in each task improved the performance of both American and Maya children in the contextualized weaving activity. However, it did not improve the Maya performance in the decontextualized

task. This supports Guberman and Greenfield's (1991) findings that implicit procedural knowledge may be analogous to explicit theories but still not transfer across contexts. It also elucidates effects of long-term enculturation in which learning is contextualized into culturally relevant tasks. This was important for us to consider as we entered local, predominantly Native Hawaiian communities with a curriculum tested largely on "Western" populations. This particular example influenced our decision not to introduce too many novel toys, tasks, or scripts into the environment. The RT paradigm is designed to access a particular families existing daily routines and not alter their world too much, another reason for the prediction that it could be adapted to serve the population in the current study.

Practically, these data provide empirical evidence to guide Western-oriented professionals attempting to assess, educate, or help children from divergent cultures such as the ones served by SPIRIT. It is a best practice to assess capabilities and needs with culturally relevant tools and tasks (Greenfield, 1997). It may also be necessary to embed assessments in contextualized environments and processes more naturalistic to a child (Greenfield, 1997; Maynard, 2004). ECS professionals must carefully consider cultural learning styles, methodologies, practices, and values (Maynard, 2005; O'Donnell, Tharp, & Wilson, 1993). This best practice will help optimize program efficiency and developmental and educational outcomes (Vogt, Jordan, & Tharp, 1987). For example, the current study performed all developmental assessments within the natural environments in which the child was accustomed and was careful to balance the fidelity of the measure and the adherence to cultural norms, scripts, and tasks.

Such theoretical issues are of practical significance for the successful adaptation of curriculums and programs from one population to another. Trumbull and colleagues (2001) published a book designed to help educators bridge these cultural gaps because of reoccurring

issues professionals were having in California schools. For example, the authors report an anecdote of a parent-teacher conference in which the American teacher attempted to compliment and reinforce her Latino student's progressing involvement in class (e.g., speaking, actively engaging, and asking questions). The Latino immigrant parents mistook this intended positive feedback about the child's oral expression and active involvement as their child not behaving respectfully or properly. This example shows how understanding such cultural differences can be imperative for engaging a family and aiding a child's transition between microsystems. Table 1 outlines other empirically derived sources of conflict between microsystems characteristic of interdependent and independent cultural pathways (Trumbull et al., 2001). These differences were helpful with program implementation and for interpreting the findings of the current study (see Section 5.2).

Table 1.

Sources of Home School Conflict

Individualism	Collectivism
Child as an individual	Child as part of the group
Independence	Helpfulness
Praise (for positive self-esteem)	Criticize (for normative behavior)
Cognitive skills	Social skills
Oral expression	Listening to authority
Parents' role is to teach	Teachers' role is to educate
Personal property	Sharing

NOTE: Adapted from Trumbull et al., 2001.

The sources of conflict in Table 1 are vital to consider when helping children transition to school, but they are not just of concern for professionals working with school-aged children. Such deeply embedded cultural influences are rooted within a young child's early environments

and interactions. Enculturation of early learning processes and tasks are deeply ingrained (Maynard & Greenfield, 2003). Such enculturation frames how young children acquire, process, and use knowledge. It also influences how they behave in and perceive all social interaction. The players, tools (including language), and values permeating the young child's microsystems, entail implicit theories of parenting, teaching, and socializing. These combine with the children themselves to shape all aspects of development. This was important to understand for the home visitors in Project SPIRIT because pedagogical models of parenting are of the independent pathway (Greenfield et al., 2003). As such, they include their own normative behavioral scripts, cultural values, required tasks, and personnel (e.g., adults as teachers). The traditional collectivist prototype may not include preparation congruent with Western learning expectations and norms. Their educational and parenting ethnotheories may vary in style and content from the more independent ones. It was important that all the players involved in the current study understood and balanced a family's cultural roots and desires with those of future contexts and expectations such as when they enter the school system.

Children also display cultural variations in tasks deemed universal beyond just knowledge acquisition and academic preparedness. Cultural parenting practices include important differences regarding autonomy and relatedness. For example, German and American parents prompt infants to sleep in a crib or different room because the independent pathway emphasizes self-actualization and autonomy (Greenfield et al., 2003; Keller, 2007). The interdependent model emphasizes "the self" in relation to the group so infants are not seen as autonomous. Therefore, co-sleeping arrangements are close to the mother and sometimes with other family members (Keller, 2007; LeVine, 1994; Seymour, 1999). These differences in basic sleeping patterns demonstrate how macrocultural ideology influences fundamental aspects of

caring and interacting with young children. These are practical issues for professionals working with young children and their families. During Project SPIRIT, caregivers often asked about the "proper" sleeping arrangements. The answer is cultural, not universal. It was imperative that home visitors understood this concept so they shared legitimate safety concerns but did not impose their own cultural beliefs upon the family under the guise of what is objectively "correct."

There are instances where it is appropriate for professionals to use developmental theory to inform parental choices. As explained, many American families guide children toward independence early, a culturally influenced choice. However, caregivers often oversimplify or overextend behaviorist principles when attempting to achieve such goals. They use strategies in situations or at ages where they do not apply. For example, a participant of SPIRIT with a four-month-old shared her stress about what to do when her infant was crying. Her mother advised her not to respond immediately to the child's cries or she would "spoil" her. A general best practice and hallmark of the RT paradigm used to help this family is to respond responsively to cues and to think developmentally in age-appropriate manners (Mahoney & MacDonald, 2007). Thus, we were working on understanding an infant is not simply a small adult, but has ontogenetically different needs and cognitive capabilities. I prompted her to put herself in the mind of the four-month-old and question the reasons for crying. She answered that the infant could not speak or fulfill her own needs so crying was a way to get her needs met. I reinforced this notion and explained the critical need for an infant to develop an attachment to a nurturing caregiver (Ainsworth & Bell, 1970; Bowlby, 1969, 1973). We discussed how responding to the child's communication attempts was a primary way of building this relationship and reinforcing communication (Landry et al., 2006; Mahoney & MacDonald, 2007). We explored behaviorist

principles of reinforcement alluding to instances where attending and responding to certain behaviors can increase unwanted behaviors. Together, we decided her mother's advice might be appropriate when the child is older and under certain circumstances. However, it was more important at this developmental age and giving the interpreted purpose of the cries that she respond responsively without worry of "spoiling the child." Importantly, I respected the cultural and family dynamics as I empowered her to come to a thoughtful decision.

Fundamental cultural values and practices manifest early in parenting models. Parenting expectations and interaction patterns often diverge along generalized independent and interdependent pathways (LeVine, 1994). Well-meaning early childhood professionals and programs risk overriding traditional cultural values and practices if they decide what is "correct" or "necessary" from their own perspective. They also risk upsetting or losing participants. This was especially important in our program because most of the existing evidence was derived from more traditionally independent, mainland US culture that differs from the more traditionally collectivist one served by our program.

Understanding patterns of cultural differences that exist in early nurturing practices and their effects on developmental outcomes will help professionals build a balanced partnership with families and other professionals. For example, Western pedagogical models of child rearing emphasize academic engagement and social exchange by promoting verbal reciprocity and use of protoconversations with young children (LeVine, 1994). However, many non-Western cultures and families in low-SES environments emphasize physical protection and soothing (LeVine, 1994). These differences manifest in everyday interactions when Western parents respond to infant babbling by eliciting excitement with questions and praise. However, parents in some other cultures tend to respond more to distress with opposite reactions such as modulating

excitement and with more directive commands (LeVine, 1994). All these responses are driven by cultural and environmental variables. This is important to understand in programs like SPIRIT when determining what variables to manipulate to "help" a child and when communicating with caregivers. For example, we often dealt with caregivers, especially fathers, engaging their young children in manners our curriculum would often label as overly directive. A fundamental principle of the RT paradigm is to teach caregivers to interact responsively with their child in reciprocal interactions by reading their cues and following their lead when applicable (Mahoney & MacDonald, 2007). Indeed, research shows such responsive interactions enhance developmental outcome such as promoting communication development, especially expressive communication (Center for the Developing Child at Harvard University, 2012; Kim & Mahoney, 2004; Landry et al., 2006; Landry, Smith, Swank, Assel, & Vellet, 2001; Mahoney & MacDonald, 2007). Identifying such interaction patterns that may be influencing developmental trajectories is important for naturalistic, caregiver-mediated intervention programs. However, it was equally important that we considered the caregivers parenting and cultural beliefs as well. Finding this balance was critical for successful implementation of SPIRIT.

Modern cultural shifts and the impact of globalization and technology have prompted a "blending" of macrocultures (Maynard, 2004) from which similar problems can arise. One example related to the proposed research is the evolution of Native Hawaiian cultures within the US macroculture and their struggles (on average) within Western pedagogical environments. In 1983, Kamehameha Schools reported ethnic Hawaiians to be one of the most at-risk populations in the entire country (as cited in Roberts, 1993). Without understanding the importance of the differences emphasized by the cultural pathways concept, some traditional researchers and professionals assumed a pattern of learning deficits in this group. However, ecoculturally minded

researchers provided evidence that a clash in the microsystem cultures was more likely responsible (as cited in Roberts, 1993). Based on this evidence, researchers developed effective educational setting modifications that effectively bridged this culture gap (Roberts, 1993; Vogt et al., 1987). Understanding the influences of the children's cultural pathways prevented misguided services and labeling. It also brought forth systemic factors critical for effectively helping the children succeed across microsystems. ECS professionals must carefully consider how to balance such critical cultural differences explored above. Dynamic Systems Theory and the Bioecological Model help view development more holistically, including the cultural and family system variables vital for achieving the goals of applied research programs like SPIRIT.

Section 2.4: Applied Best Practices and the RT Paradigm

In order to develop - intellectually, emotionally, socially, and morally - a child requires participation in progressively more complex reciprocal activity, on a regular basis over an extended period in the child's life, with one or more persons with whom the child develops a strong, mutual, irrational, emotional attachment and who is committed to the child's well-being and development, preferably for life (Bronfenbrenner, 1990, p. 1).

As will be shown throughout this section, RT is built on substantial evidence for using a family- centered, relationship-based approach to guide ECS (for review see: Bailey et al., 2011; Boettcher, Koegel, McNerney, & Koegel, 2003; Dunst, 2010; Mahoney & Bella, 1998; Mahoney & Nam, 2011). Research shows this approach helps caregivers interact responsively within every day routines to strengthen their relationships with their child and enhance development and well-being (Karaaslan et al., 2011, 2012; Kim & Mahoney, 2007; Mahoney et al., 1998; Mahoney & MacDonald, 2005; Mahoney & Perales, 2005; Mahoney & Powell, 1988; Mahoney et al., 1992;

Mahoney et al., 2014). Emphasizing daily interactions within naturalistic environments and routines bolsters program effectiveness, compliance, and sustainability. Caregivers are empowered to stimulate their child's overall development using the time and opportunities naturally available. RT does not "rearrange a family's world" or ask them to perform tasks alien to them. Such naturalistic, family-centered approaches reduce family stressors, promote functional generalization of skills, and increase the likelihood that effective strategies are more likely to be implemented and maintained (Bailey et al., 2011; Boettcher et al., 2003; Koegel, Koegel, Freeden, & Gengoux, 2008; Mahoney & MacDonald, 2007; Mahoney & Nam, 2011).

RT focuses on building a relationship with a family and using it to encourage responsive interactions between caregivers and their child(ren). These interactions are the active ingredients for building healthy attachment relationships and for promoting growth and learning (Hirsch-Pasek et al., 2003; Mahoney & Weeden, 1997; NSCDC, 2004b; Shonkoff, 2004). Bidirectionally, interactions and relationships "are woven together, like pandanus mats, into a foundation" of supportive systems necessary for optimal developmental progression across all domains (Onikama, Hammond, & Koki, 1998, p. 19).

Project SPIRIT was built upon the themes and best practices listed in the introduction of Chapter 2 and explored throughout. The following sections explore the final three best practices listed in the introduction of Chapter 2. First, early childhood services should use a strength-based approach to include, empower, and permeate the family system surrounding the child in need. Second, early childhood services should use relationship-based services that build on existing relationships using play and other routine activities to help the child grow and learn. Third, responsivity is a key component to attachment, parenting, and learning that should be addressed in early childhood services. These categories were derived from a careful analysis of literature

and years of personal experience. Each section below includes specific practices and issues related to implementing sometimes contradicting research findings. Such incongruences produce deferring general approaches to ECS and conflicting paradigms. Thus, each section analyzes theory, research, and developmental phenomena to support each best practice category. When applicable, research concerning contradicting practices, perspectives, and paradigms are compared. Importantly, the RT paradigm was chosen as an exemplar because it was designed around the empirically derived best practices below, not vice versa.

Section 2.4.1: Strength-based, family-centered service delivery. It is a general best practice for programs and professionals to adhere to family-centered principles. The medical model or expert driven philosophies of the past have shifted to family-centered best practices based on robust empirical support (Bailey et al., 2011; Bronfenbrenner, 1990; Bruder, 2000; Bruner, 1983; Dunst, 2010; Dunst, Trivette, & Deal, 1994; Trivette, Deal, & Dunst, 1986, Mahoney & Bella, 1998). Expert driven models create uneven power dynamics and mostly a unidirectional flow of information toward the family. The expert holds the knowledge and decides what is needed. This often prompts families to be passive recipients (Bailey et al., 2011). SPIRIT used the RT paradigm to empower caregivers as the active, driving force in their child's development because they are the experts, decision-makers, and constant presence in their child's life that have the most opportunities to engage in responsive interactions with their child (Mahoney & MacDonald, 2007; Mahoney & Nam, 2011; see Table 2).

Medical models also encourage a deficit-based approach that often labels a child or even an entire family. The family and caregivers must often declare their child or themselves deficient in some manner to attain services (Bronfenbrenner, 1990). The amount of assistance is linked to that of the deficit - the more deficient, the more aid (Bronfenbrenner, 1990). Problematically,

families hesitant to declare deficits and those who could benefit most (e.g., at-risk, mild delays) often go unassisted (Bronfenbrenner, 1990; Gargiulo, 2011). Conversely, RT is a strength-based approach evidenced to help special needs children from diverse backgrounds as will be explored in detail in Sections 2.4 and 2.5 (Karaaslan et al., 2011, 2012; Kim & Mahoney, 2005; Mahoney & Perales, 2003, 2005). These findings support that RT may effectively build on the strengths of children who are "at-risk" because of undiagnosed delays, mild delays, and/or exposure to at-risk environments. This approach was very important because research has shown that these children are the most likely to be excluded from services yet may benefit most from those services (Johnson et al., 2011). Thus, we did not require any pre-existing diagnosis, and we performed a full developmental assessment for all children entering the program. We did not turn anyone away creating a sample with diverse ability levels and needs. This is the first study using the RT paradigm to take this approach.

Although progress has been made, many ECS lack a functional component specifically designed to empower families (Bailey et al., 2011; Johnson et al., 2011; Mahoney & Bella, 1998); however, this is a fundamental principal of the RT paradigm as will be evidenced in this section. It is a best practice to intertwine strength-based, family-centered principles into all aspects of ECS delivery. Bailey et al. (2011) analyzed the literature and extracted four specific best practices characteristic of family-centered services (p. 672):

1) focus on child and family strengths, not deficits;
2) encourage family decision-making and empowerment, including respecting families cultural and linguistic preferences;
3) effectively communicate and collaborate with families;

4) use both formal and informal support systems to maximize positive family adaptation.

Their second recommended practice is a noteworthy finding. It settles a long-standing argument in service delivery philosophy. The argument is whether to include the family as active participants or as respected team members providing general input. For example, some believe relieving the family of such an active role helps them by lessening their emotional and resource (e.g., time, energy) burden (Bailey et al., 2011). However, data support a more active role in the process as a best practice. It helps families feel more empowered, confident, competent, and hopeful as they acquire new skills and strengthen existing abilities (Bailey et al., 2011; Dunst, 2010; Dunst et al., 1994; Kaiser, Hemmeter, Ostrosky, Fischer, Yoder, & Keefer, 1996; Mahoney & Bella, 1998; Mahoney & MacDonald, 2007; Mahoney & Nam, 2011; Nachshen & Minnes, 2005; Onikama et al., 1998).

The RT paradigm not only includes the family, but also empowers them to enhance their relationship with their child and be the active driver of their child's development. It is built upon family-centered best practice concepts. However, it goes beyond simply working collaboratively with caregivers. It is a caregiver-mediated process that takes the family-centered philosophy to a higher level. RT works with and through caregivers and family members. It helps them interact in ways that strengthen relationships and propel their child's overall development (Mahoney & MacDonald, 2007; Mahoney & Nam, 2011). Responsive interactions with caregivers are vital for helping children learn and grow. Both Piaget (1963) and Vygotsky (1978) emphasized that learning and development take place through scaffolded performance via interactions with more capable participants (Hirsch-Pasek et al., 2003; Landry et al., 2006; Wertsch, 1985a, 1985b). Such individualized scaffolding is possible in small group environments but becomes difficult as

the ratio of children to caregivers increases. One can be more effectively responsive to a child's individual characteristics and particular Zone of Proximal Development (Vygotsky, 1978) during one-on-one interactions. Importantly, caregivers have more opportunities to engage in such interactions than anyone else does in the early years of life. Table 2 shows evidence of this even when young children are enrolled in formal learning programs and receiving special needs services. It displays the context and calculations of the RT researchers' observational study of the amount of opportunities to engage in one-on-one interactions over the course of a year (Mahoney & MacDonald, 2007).

Table 2.

Comparison of Opportunities for One-On-One Interactions

	Teachers	Therapists/Specialist	Primary Caregiver
Context for interaction	2.5 hrs/day; 4 days/wk 2 teachers, 12 children	30 min session 1 day/wk	1 hr/day, 7 days/wk
1-1 time/wk (min)	33	25	420
Weeks/year	30	30	52
Interactions/min	10	10	10
Interactions/year	9,900	7,500	220,000
Opportunity %	4.5%	3.4%	92.1%

Note. Adapted from Mahoney & MacDonald, 2007, p. 10.

The interaction opportunity estimations in Table 2 may vary across people and contexts. However, caregivers still hold an 84.2% advantage even if the opportunities for teachers and specialists are doubled. Moreover, calculations are based on a caregiver directly interacting for just one hour per day. They clearly have more opportunities to interact in manners empirically shown to help children optimally develop. Furthermore, caregivers have special relationships with their children and are more likely than professionals to remain with them throughout their

developmental trajectory. They also accompany their child across microsystems so can better assist with contextual generalizations and mesosystem communications and transitions. These reasons bolster the importance of caregiver interactions and a family-centered approach for helping young children. In fact, Mahoney, Wheeden, & Perales (2004) studied children (n = 70) in 41 different preschool special education classrooms based upon either developmental (n = 27), didactic (n = 15), or naturalistic (n = 28) instructional models. No significant differences were found in the children's rate of development because of the different teacher interaction styles. However, their rate of development was significantly related to the parents' style of interaction. They found that parental responsiveness predicted children's progress in preschool classrooms, but trying to enhance the responsiveness of classroom professionals without engaging the parents did not enhance developmental outcomes. These data evidence the importance of engaging in family-centered intervention paradigms like those tested by the current study. Furthermore, the observational analyses in this study included all of the children in the classrooms, not just those with specific diagnose or general developmental delays. This is important to the current study because it supports the prediction that the RT paradigm could be used to help children with diverse ability levels because it focuses on enhancing the same caregiver-child responsiveness the study above found to correlate with developmental outcomes. Furthermore, the study above used the MBRS instrument to measure parental responsivity with these diverse children, as does the current study.

Section 2.4.2. Relationship-based service delivery. A relationship-based approach is a best practice for ECS (Bailey et al., 2011; Bronfenbrenner, 1990; Griffin, Connie, & Turnbull, 2010; Gutstein, Burgess, & Montfort, 2007; Karaaslan et al., 2011, 2012; Kelly, 2000; Kelly, Zuckerman, & Rosenblatt, 2008; Kim & Mahoney, 2005; Koegel et al., 2008; Mahoney & Bella,

1998; Mahoney & Perales, 2003, 2005; McCollum & Hemmeter, 1997; NSCDC, 2004b; Sandall, McLean, & Smith, 2000). This philosophy includes a few general objectives and specific practices deemed best. The primary objective is to strengthen attachment relationships between children and caregivers. As such, it is explored in-depth as the theme of the next section.

A relationship-based approach also focuses on the relationships between all players throughout a system of care. The entire organizational structure should reflect the relationship building concepts emphasized within the program itself. This creates an organizational culture in which relationship-based concepts are ubiquitous (Bailey et al., 2011). This top-down, system-wide approach enhances program effectiveness. The concepts filter down to the service provider and family relationships and, in turn, to the caregivers and child relationships. Project SPIRIT followed this approach by continuously modeling and reinforcing relationship-based principles and strategies develop a solid foundation for efficacious service delivery (Bailey et al., 2011).

Relationship-based philosophy is also a specific ideology for teaching young children. It promotes relationship-based interactions as the vehicles in which to embed all "teaching." The basic principle is to use relationships and social play to promote foundational processes of learning (e.g., joint activity, exploration, self-regulation) empirically shown to propel cognitive, communicative, and social-emotional development (Fey, Warren, Brady, Finestack, Bredin-Oja, Fairchild, & Yoder, 2006; Hirsch-Pasek et al., 2003, Landry et al., 2006; Mahoney & MacDonald, 2007; Piaget, 1963, 1977; Tamis-LeMonda, Bornstein, Baumwell, & Melstein-Damast, 1996; Vygotsky, 1978; Wertsch, 1985b). The paradigm is a critical distinction from ECS programs that focus on didactic teaching of discrete or academic skills (e.g., practicing letters or numbers, holding a pencil, writing, rote vocabulary acquisition). Many caregivers and professionals stereotype "teaching" as the didactic teaching model they remember from schools

and universities. It reflects the Western pedagogy of formalized instruction and curricula. A teacher develops a plan to enhance discrete skills and academic learning objectives. The expert instructor imparts their knowledge through formalized instruction that is often highly verbal, distal, and directive (Maynard, 2004)**.** This paradigm is not developmentally appropriate for younger children. They lack the necessary cognitive, linguistic, and self-regulation skills (for review see: Mahoney & MacDonald, 2007).

Contrarily, relationship-based procedures help children develop foundational or pivotal skills-based on research indicating young children learn best through social play and relationship-based interactions that motivate and scaffold learning (Fey et al., 2006; Hirsch-Pasek et al., 2003; Koegel, Koegel, & Carter, 1999; Landry et al., 2006; Mahoney & MacDonald, 2007; Tamis-LeMonda et al., 1996; Vygotsky, 1978; Wertsch, 1985b). Some argue for the didactic teaching of discrete skills or Discrete Trial Training (DTT) as the best way to help young children learn (Lovaas, 1981; Smith, 2001). Individualized, relationship-based approaches like the one used in the current study that focus on pivotal response and behaviors are more developmentally appropriate and evidenced to build an overall foundation that prepares children for school and lifelong learning. As Koegel, Koegel, & Camarata (2010) report, there are over 200 journal articles that support this claim (for summary see Koegel, Koegel, Vernon, & Brookman-Frazee, 2010). The RT paradigm provides an exemplar of why this is true, especially when compared to more didactic oriented programs as explored below.

RT uses relationship-based strategies to promote foundational processes of development and learning or pivotal behaviors. Pivotal behaviors support increasingly higher levels of developmental functioning by enhancing a child's ability and motivation to learn (Koegel, et al., 1999; Koegel, Koegel et al., 2010; Mahoney, Kim, & Lin, 2007; Mahoney & MacDonald, 2007).

They are “behaviors that are central to wide areas of functioning, such that a change in the pivotal behavior will produce improvements across a number of behaviors” (Koegel, et al., 1999, p. 577). Table 3 compares empirically derived reasons for focusing on pivotal behaviors and not the discrete skills emphasized by formal learning environments and many ECS (e.g., Intensive Behavioral Interventions).

Table 3.

A Comparison of Pivotal Behaviors and Discrete Skills

Pivotal Behaviors	**Discrete Skills**
Active learning processes are the basis for developmental learning	Products of learning
Simultaneous behaviors used continually throughout the developmental period	Prerequisites to more complex behavior
Behaviors children capable of doing from an early age	Behaviors children do not know how to do
Behaviors useful across contexts	Utility of behavior is context dependent
Behaviors seldom used in devel assessments	Behaviors often used to assess competence

Note. Adapted from Mahoney, 2007, p. 46.

RT does not categorically exclude the practice of discrete skills. It simply focuses on the pivotal behaviors that allow children to learn instead of trying to teach the seemingly infinite amount of specific skills that one might learn. This focus promotes progression among a wide area of domains and skills (Koegel, et al., 1999; Koegel et al., 2010; Mahoney et al., 2007; Mahoney & MacDonald, 2007), and it simplifies curriculum and service procedures. RT helps children and caregivers develop a foundation and system of overall learning, instead of constantly trying to fill gaps in knowledge or skills. Popular Intensive Behavioral Intervention (IBI) programs for helping young children with developmental disorders elucidate this point. For example, traditional Applied Behavioral Analysis (ABA) teaches discrete skills through

behaviorist principles (Lovaas, 1981; Miltenberger, 2008; Skinner, 1957, Smith, 2001). It uses the Assessment of Basic Language and Learning Skills or ABLLS (Partington, 2006) as "an assessment tool, curriculum guide, and skills-tracking system used to help guide the instruction of language and critical learner skills" (Behavior Analysts, 2013, para. 1). The ABLLS assessment tool and curriculum guide has 25 categories that include over 544 discrete skills. Furthermore, his is not an exhaustive list of skills (Partington, 2006). The RTC is based upon only the 16 pivotal behaviors listed in Table 4. They are a concise collection of behaviors proven to impact and generalizability across domains, contexts, and time (Mahoney & MacDonald, 2007).

Table 4.

Developmental Domains and Corresponding Pivotal Behaviors

Cognition	**Communication**	**Social-Emotional**
Social Play	Joint Activity	Trust
Initiation	Joint Attention	Empathy
Exploration	Vocalization	Cooperation
Problem Solving	Intentional Communication	Self Regulation
Practice	Conversation	Feelings Of Confidence
		Feelings Of Self Control

Note. Adapted from Mahoney & MacDonald, 2007.

I worked within and designed various IBI and ABA-based programs for over a decade. The paradigm was mostly a didactic teaching model based on Western pedagogy and more appropriate for older children and adults (Mahoney & MacDonald, 2007). I spent many hours performing "table work" with children chronologically or developmentally below the age of five. It is not developmentally appropriate to expect these children to sit for long periods and functionally receive input while maintaining motivation to engage and learn. They have not yet

developed the necessary self-regulation, attention, motivation, and cognitive skills (Mahoney & MacDonald, 2007).

Upon reflection, the participants' behavioral-based programs often were deficit models focused on using DTT to improve discrete skills that were difficult to generalize across contexts and people. Furthermore, the disjointed skills would often fade quickly if not specifically maintained via behavioral reinforcement. Even proponents of IBI and ABA approaches share these concerns noting that a contrived instructional approach can produce rote responses and that the lack of response and skill retention and generalization is of major concern (Steege, Mace, Perry, & Longnecker, 2007; Sundberg & Partington, 1998). Behaviorist principles such as DTT have their place in ECS but are limited by these concerns and their inability to simulate naturalistic, pragmatic contexts that are especially important for social and linguistic development. That is why many paradigms that emerged from ABA and IBI perspectives have evolved to become more naturalistic and relationship-based such as incidental teaching (Hart & Risley, 1975 and 1982), naturalistic teaching (Sundberg & Partington, 1998), enhanced milieu teaching, (Hancock & Kaiser, 2002), and Relationship Development Intervention (Gutstein et al., 2007). Perhaps the most popular approach emerging from strict behavioral roots is "Floortime" built upon the Developmental, Individual-difference, Relationship-based approach or DIR (Wieder & Greenspan, 2001). Lal & Chhabria (2013) provide a comprehensive review of the substantial evidence that supports the DIR approach and its main objective to "build healthy foundations for social, emotional, and intellectual capacities rather than focusing on skills and isolated behaviors" (p. 697). Wieder and Greenspan (2001) explain their approach was developed to be child-centered and create the type of communication, social, and learning contexts more naturally reflective of the environment in which children develop. Kane, Connell,

and Pellecchia (2008) performed a meta-analysis comparing contrived, DTT approaches to more naturalistic, relationship-based ones and found the latter to be more effective for teaching and maintaining language skills supporting this perspective.

Pivotal Response Training (PRT) is another relationship-based approach that emerged to address the limitations of ABA and other IBI approaches (Koegel, et al., 1999). It is closely related to the RT paradigm because it also focuses on enhancing development through pivotal response or behaviors. Researchers have used experimental paradigms to compare this approach to directly ABA and DTT. The data indicated that this type of approach was significantly better at enhancing the production of speech sounds, language intelligibility, and properly used language while reducing problem behaviors in young children with ASD (Koegel, Camarata, Koegel, Ben-Tall, & Smith, 1998; Koegel, Koegel, & Surratt, 1992). Mahoney and Perales (2005) also used a relationship-based approach focusing on pivotal behaviors and not discreet skills to significantly improve the linguistic skills of young children (n = 50) who were classified in two cohorts. The "developmental disabilities" cohort (n = 30) was comprised of children pre-diagnosed with cerebral palsy (n = 1), Down syndrome (n = 1), neurofibromatosis (n = 1), speech/language delay (n = 14) and general developmental delays (n = 13). The PDD cohort (n = 20) was comprised of children pre-diagnosed with ASD (n = 10), ASD and mental retardation (n = 3), or general pervasive developmental disorder (n = 7). RT sessions focusing on a single parent-child dyad were conducted either in their homes or at center-based facilities. The participants averaged 32.6 RT sessions (*SD* = 12.9) over an average of 11.3 months (SD = 2.1). This approach improved the children's expressive language by 167% and their receptive language by 138% overall. The children also increased their cognitive domain scores by 60% and their social competence by 28% overall. Both sets of researchers explain these significant

gains via the enhancement of relationships and pivotal behaviors following the model displayed by Figure 2. Although these factors manifest via cultural pathways and idiosyncratic family system variables, they also reflect universal developmental and relational needs as discussed in Sections 2.2, 2.3, and 2.4. Thus, it was predicted that the RT paradigm could be adapted to serve the populations in the current study based on the findings, themes, and best practices detailed in this dissertation.

The effectiveness of a relationship-based approach that focuses on foundations of learning is not surprising for a student of child development. As Chomsky (1959) outlined, children do not acquire robust language and communication via the principles of behaviorism outlined by Skinner. Rote mimicking of words and phrases followed by reinforcement does not effectively teach functional language and is not reflective of how children typically learn to communicate (Chomsky, 1959). Furthermore, play and social interactions are vital methods of learning behavioral, academic, and cultural skills and scripts. Behavioral principles and practicing discrete skills have a selective place in early childhood learning. However, relationships provide the active ingredients for a child's overall development (Shonkoff, 2004). RT was chosen as the proper paradigm for the current study because it is designed primarily to enhance these relationships and promote the vital responsive interactions described in the section below.

Section 2.4.3: Responsivity as a focus of service delivery. This section will provide theoretical and empirical support the best practice of focusing on dimensions of responsivity when interacting, educating, and helping children under the age of five. This is a crucial component of the RT paradigm and success of the current study. As accentuated throughout this review, relationships are the active ingredients mediating and moderating environmental

influences on all children (Center on the Developing Child at Harvard University, 2012; Shonkoff, 2004). The NSCDC (2012) emphasizes the importance of the reciprocal, "serve and return" interactions children share with caregivers. This essential need is universal to human biology and development. They stress that "beginning immediately after birth, a strong foundation for human well-being requires responsive environments and supportive relationships to build sturdy brain circuits, facilitate emerging capabilities, and strengthen the roots of physical and mental health" (Center on the Developing Child at Harvard University, 2012, p. 1). Section 1 of this review summarizes this process because it is critically important for professionals and caregivers to comprehend. Responsive, "serve and return" interactions are the vehicles in which children develop and learn everything. This is true across all domains and all knowledge, whether developmental, academic, or cultural.

Responsivity is vital in the early years when children are heavily dependent on and influenced by primary players in their immediate microsystems (Bornstein, 1989, 2002, and 2006; Gallagher, 2004; Landry et al., 2006; Mahoney & MacDonald, 2007), and parental responsiveness is the main predictor of developmental outcomes even when children are receiving ECS (Fewell & Deutscher, 2004; Mahoney & Perales, 2005). Enhancing parental responsiveness in the early years helps prepare them for school and lifelong success. It has been shown to be a predictor of children's progress in preschool classrooms (Mahoney & Perales, 2004) and their developmental trajectory beyond preschool (Fewell & Deutcher, 2004). Responsive interactions engage children socially and emotionally, peaks their interest and motivation, and is mutually reinforcing for both caregivers and children (Bornstein, 1989 and 2002; Koegel, et al., 1999; Koegel et al., 2010; Mahoney & MacDonald, 2007; Mahoney et al., 2006). Such engagement is universally required for transmission of behavioral, cultural, and

communicative skills and scripts (Bornstein & Cote, 2006; Bronfenbrenner, 1990; Center on the Developing Child at Harvard University, 2011; NSCDC, 2004b; Shonkoff, 2004). As such, parental responsiveness is the most consistent predictor of developmental outcomes for young children (Mahoney & MacDonald, 2007).

Responsive interactions are so fundamental that healthy development is dependent on them. A lack thereof is "a serious threat to child well-being, especially during the early years" (Center on the Developing Child at Harvard University, 2012, p. 1). This threat manifests biologically via increased levels of stress hormones and pathological activation of the body's stress response system (Center on the Developing Child at Harvard University, 2012). Negative consequences of these effects during the early years can affect a child's developmental trajectory across their lifespan. The absence of responsive, reciprocal engagements within early sensitive periods can retard or even prevent comprehensive linguistic and self-regulation development (Center on the Developing Child at Harvard University, 2012). This can have lifelong consequences, especially when transitioning to formal learning environments and expectations. Impairment in communicative and socioemotional skills can consequently affect cognitive development because they are modes of learning and means of transmission. Furthermore, cognitive capacities are activated by the executive functions and social skills directly affected by a lack of responsive interactions (Center on the Developing Child at Harvard University, 2011). Finally, "serve and return" engagements are mutually reinforcing and a fundamental building block of healthy attachments (Ainsworth & Bell, 1970; Bornstein, 1989, 2002, and 2006; Center on the Developing Child at Harvard University, 2012; Bowlby, 1969 and1973, Mahoney & Macdonald, 2007).

Notice the emphasis of responsive, nurturing interactions and not "attachment," per se. This is for three reasons important for the delivery of ECS that are explored in this section. First, focusing on responsivity reduces overgeneralization of universal assumptions across cultural pathways. Second, responsivity is the component of attachment evidenced as most influential for building healthy attachments. It is the component most characteristic of the type of relationships universally necessary for human development. Third, universal dimensions of responsivity are operationalized in a manner that are more simple and effective for guiding ECS while reducing the potential for culturally biased services.

Importantly, an argument for the universal dimensions of responsivity does not preclude cultural or familial variations of healthy interaction and relationship styles. I argue that it simply reduces variability and the dangers of sweeping generalizations by segmenting attachment into the active building blocks (Mahoney & MacDonald, 2007). Reducing the broad concept of attachment to these specific, functional components also makes it simpler to operationalize as a best practice for ECS. It is easier to explain and develop strategies based around responsive interactions rather than the broader concept of attachment. Teaching strategies that are more specific because they are related to the narrower concept of responsivity makes it easier to explain and individualize to a family's cultural dynamics.

While seminal attachment research (Ainsworth & Bell, 1970, Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969 and 1973) included some cross-cultural data, it was not culturally expansive and was filtered through Western ideology (Rothbaum, Rosen, Ujiie, & Uchida, 2002). Universal importance of the need for some type of "attachment" with caregivers is widely accepted. However, the operationalization, implications, and descriptions of the characteristics of

attachment are controversial. It is not valid to use Ainsworth's[2] protocol and labels to predict pathology across cultures because of important cultural variations. For example, attachment research in Japan produced an indigenous concept of caregiver child relatedness termed *amae*[3] (Doi, 1973). Japanese children, on average, show higher levels of distress when separated from parents because of the enculturation of *amae* principles. This is an adaptive cultural specificity. However, it could be perceived as a maladaptive deficit if not viewed through its goodness of fit within cultural context (Bornstein, Azuma, Tamis-LeMonda, & Ogino, 1990; Rothbaum, Weisz, Pott, Miyaki, 2000).

Programs based upon traditional attachment research may attempt to "correct" a culturally sound interaction style. Rothbaum et al. (2002) criticize the attachment literature's overreaching implications of universality and the downplaying of deeply embedded cultural differences. However, they "do not deny the biological and evolutionary predispositions that underlie attachment, but [emphasize that] biology and culture are inseparable aspects of the system" (p. 1095). This view is akin to the best practices outlined in this review. I argue that focusing on the "predispositions that underlie attachment" yields more universal motivations such as health, security, and well-being. Such universalities imply the human need for nurturing relationships. If these relationships can be segmented into underlying components such as responsivity as the research proposed does, cultural variation would theoretically lessen although still exist.

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[2] Secure, avoiding, ambivalent/resistant, and disorganized categories were developed to label behavioral patterns characteristic of general attachment styles (Ainsworth et al., 1978).

[3] *Amae* is a strong interdependent relationship emphasizing a child's almost complete dependence on a caregiver and resistance to separation (Doi, 1973). An emphasis on dependence and resistance to separation has obvious implications to attachment definitions drawn from Western concepts and assessments.

Interestingly, Bornstein (2006) found evidence supporting such important cultural differences in attachment (see also Bornstein, Cote, Haynes, Suwalsky, & Bakeman, 2012) yet found similar characteristics of responsiveness in naturalistic settings in New York, Paris, and Tokyo (Bornstein, Tamis-LeMonda, Tal, Ludemann, Toda, & Rahn, 1992). Bornstein (1989) also provides evidence that the Japanese construct *amae* includes dimensions of responsiveness related to developmental growth in the early years. Similarly, authoritative parenting styles of interaction in the US show goodness of fit variations related to ethnicity and SES, but parental responsiveness remains constantly related to rates of development (Bradley, 1989). Furthermore, responsiveness is a characteristic of caregiving evidenced to predict developmental ages and IQ scores (Beckwith & Cohen, 1989; Fewell, Casal, Glick, Wheeden, & Spiker, 1996), promote communication development (Bornstein, Tamis-Lemonda, & Haynes, 1999), and influence social emotional development (Center on the Developing Child at Harvard University, 2011, 2012; Kochanska, Forman, & Coy, 1999; Mahoney & MacDonald, 2007). It mediates the effects of maternal depression on a child (Center on the Developing Child at Harvard University, 2009) and provides a protective factor supporting longitudinal resiliency (Werner, 1993). Responsivity is also critically important to the optimal development of children with intellectual disabilities (Warren & Brady, 2007) and developmental disorders and delays (Fey et al., 2006; Mahoney et al., 1998). As this diverse collection of research across many cultures indicates, responsivity is the key component of attachment that consistently correlates with many positive relationship and developmental outcomes. This is important because increasing caregiver responsiveness to strengthen relationships and enhance developmental outcomes is the primary goal of the research being proposed. Furthermore, the importance of responsive interactions being evidenced across cultures suggests the RT paradigm can indeed be adapted to serve a new population.

Section 2.5: Conclusion

RT is an exemplar of empirically derived best practices because it is designed to enhance parental responsiveness and use these interactions to help a child succeed. Mahoney & MacDonald (2007) generally define responsivity as an orientation toward a child viewed through a developmental lens with the purpose of supporting and encouraging their growth and progress. Importantly, they use empirical evidence to operationalize five key dimensions of responsivity and provide strategies designed to promote each dimension as displayed in Figure 1. Using these strategies to help caregivers engage their child in responsive interactions is theorized to promote the pivotal behaviors discussed in Section 2.4.2 and ultimately propel developmental outcomes as elucidated by Figure 2 (Mahoney & MacDonald, 2007).

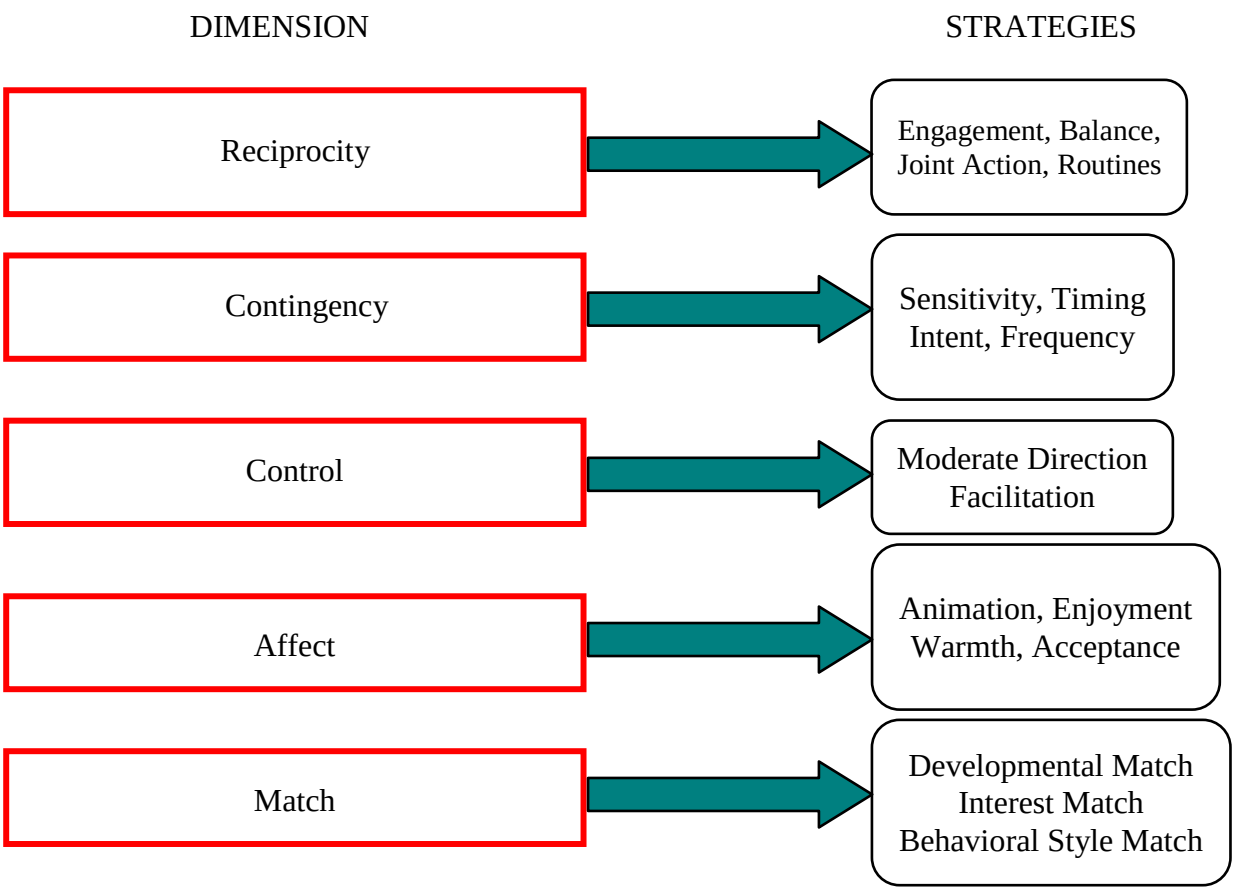


Figure 1: The five dimensions of responsivity and strategies used to promote them.

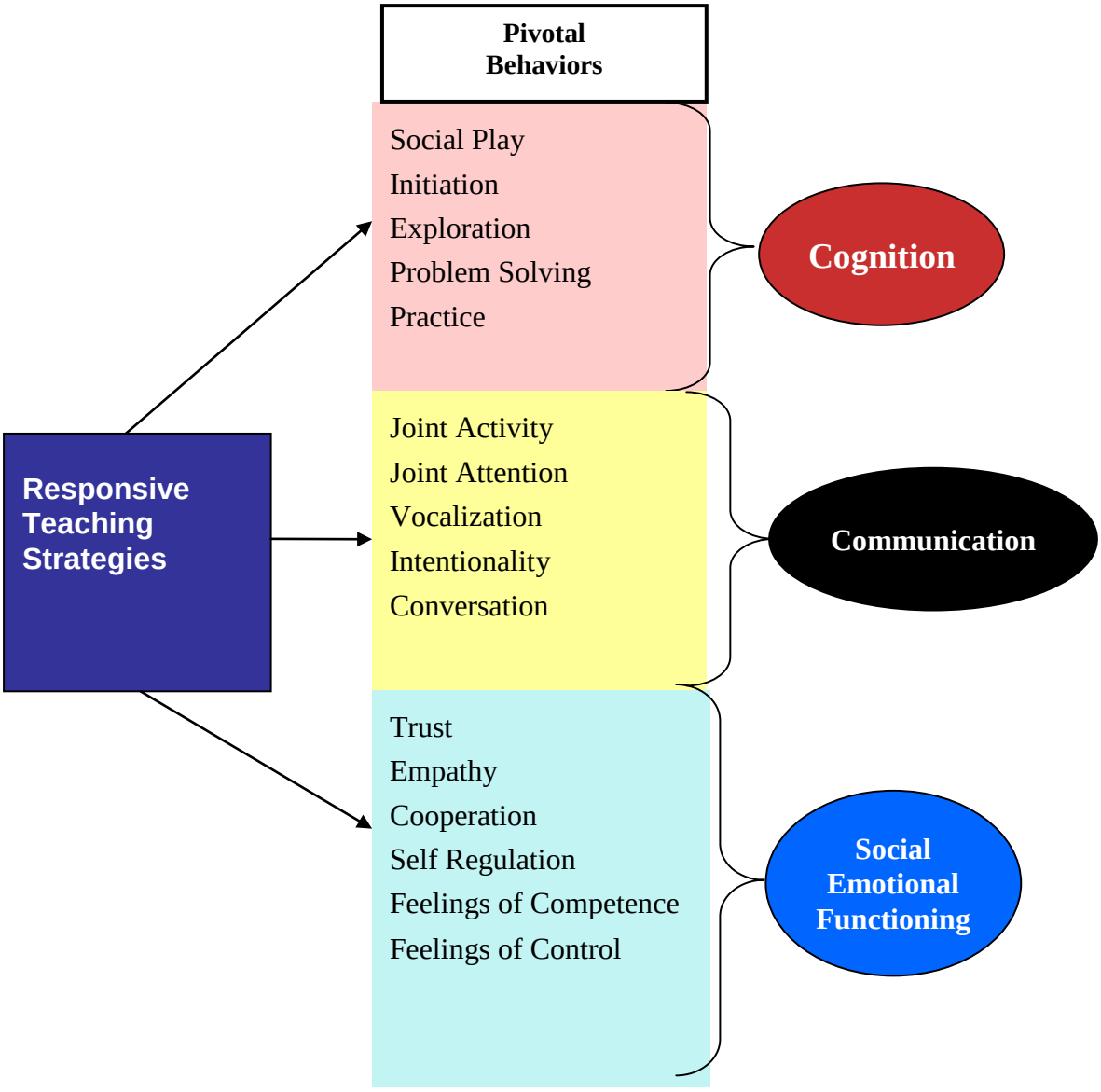
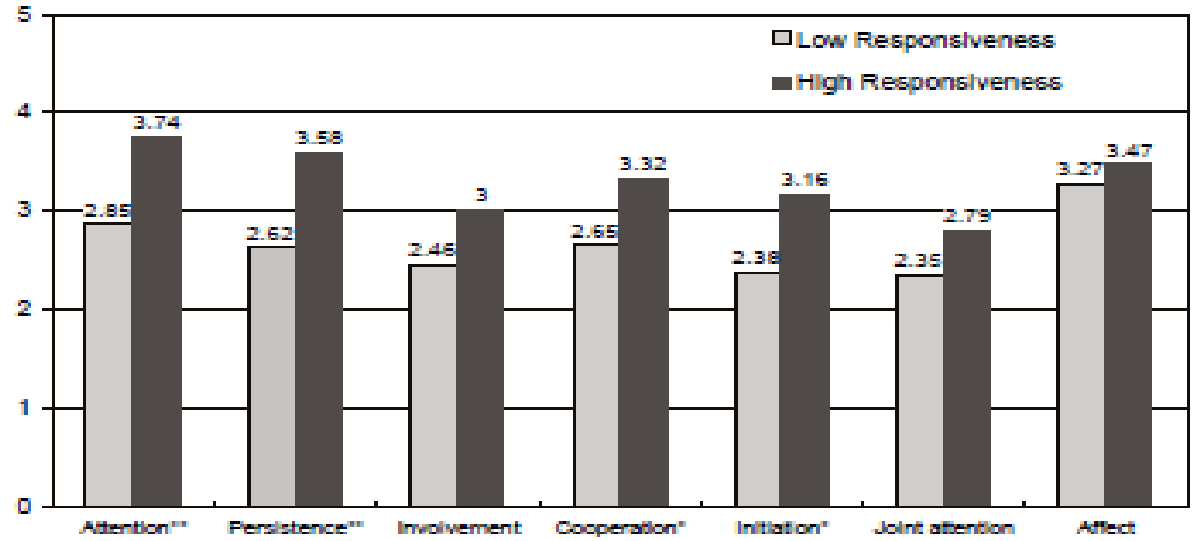


Figure 2. How responsive interactions are theorized to increase developmental outcomes by promoting pivotal behaviors.

The RT paradigm was chosen for the current study because it is based on the best practices delineated in this section and supported by a series of studies conducted throughout the last three decades (for review see Mahoney et al., 2006; Mahoney & Nam, 2011). For example, Figure 3 (Mahoney et al., 2006) shows that when mothers (n = 45) of children (M_{age} = 25 months) with disabilities increased their levels of responsivity, their children's pivotal behaviors

increased. Building on these findings, (Mahoney et al., (2007) performed a descriptive study observing parent-child dyads (n = 45) including children identified as having developmental delays (n = 19), speech delays (n = 8), dyspraxia (n = 5), ASD (n = 8), Down syndrome (n = 1), neurofibromatosis (n = 1), motor disorder (n = 1), and other medical conditions (n = 2). They found mothers' responsiveness significantly correlated with the children's developmental level use of pivotal behaviors, and pivotal behaviors significantly correlated with the child's rate of social, communication, and cognitive development. Importantly, the effects of parental responsiveness on developmental outcomes were mediated by the child's engagement in the pivotal behaviors. These findings provide evidence supporting the each of the best practices outlined in Section 2.4 that were the emphasis of the current study. That is, to use the family-centered approach described in Section 2.4.1paradigm to enhance parental responsiveness as explored in Section 2.4.3 to emphasize increasing the use of pivotal behaviors and not the teaching of discreet skills.



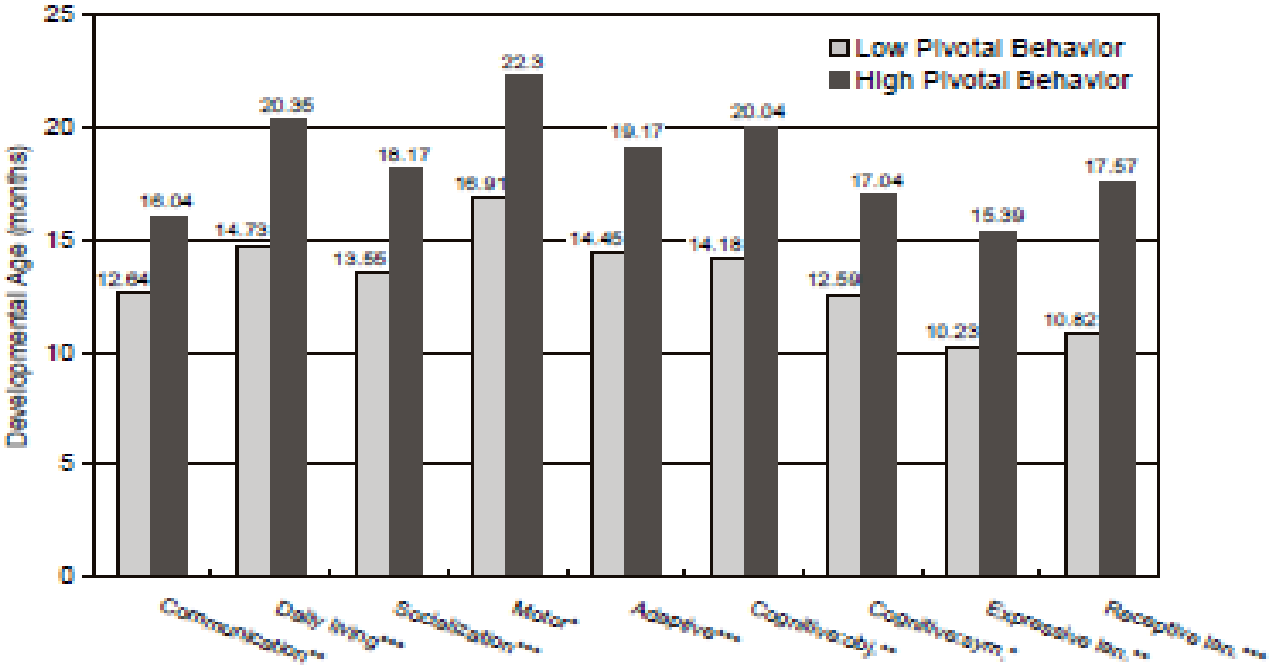


Figure 3. High responsiveness correlates with increased levels of pivotal behaviors and that higher levels of pivotal behaviors, in turn, correlate with higher developmental functioning.

While the findings above offer support for the paradigm used in the current study, these data were collected from a sample of children who were all identified as having disorders or delays and who represent quite a different ethnic composition (i.e., 88.9% Caucasian, 8.9% African-American, 2.2% Asian) than the current study's sample in which 95.5% were of at least partial Native Hawaiian descent. Importantly, the RTC is built for flexible adaptation to the specific needs and desires of a child and family. Mahoney and MacDonald (2007) state clearly that RT is not about teaching one version of "good parenting." They repeatedly emphasize variations between cultures and families. Because of this, researchers have been able to adapt the RT paradigm effectively to cultures divergent from the American ones in which most of the RT research has been tested. Kim and Mahoney (2005) implemented a Relationship Focused Intervention (RFI) in Korea designed to enhance the responsivity between Korean mothers (n = 18), and their children (M_{age} = 6.2) with identified as having general developmental delays. Parents in the experimental group significantly increased the number and quality of the responsive interactions. This resulted in improved developmental outcomes and reduced maternal stress. The results "demonstrated that RFI, which evolved primarily from investigation in Western countries, can be successfully implemented with Korean mothers" (p. 11).

Since then, RFI evolved into RT and was implemented in Turkey using a randomized control study of 19 Turkish mothers with children (M_{age} = 50 months) with disabilities (Karaaslan et al., 2011). The sample included children with a pre-diagnosis of Down syndrome (n = 6), ASD (n = 9), or intellectual disabilities (n = 4). Control group received standard early intervention services at local centers two days per week. They would attend group preschool instruction on one of the days. On the other day, they received individual instruction by "a special education teacher using behavioral instructional methods to teach the skills and behaviors

that had been prescribed for the child" (p. 21). The experimental group attended two, 90-minute sessions each week for four months either in their home or at a center-based facility. These sessions followed the RT paradigm promoting responsive interactions between the mothers and their child to enhance the use of pivotal behaviors. Mothers in the experimental group significantly increased responsiveness, and their children's developmental quotient increased forty-two percent. Mothers in the control group did not significantly increase responsivity, and their children's developmental quotient only increased seven percent. Similarly, Karaaslan et al. (2012) designed a similar randomized control study to test the effectiveness of RT as an intervention for 15 Turkish preschoolers (M_{age} = 49.3 months) with Down syndrome. Once again, the mothers in the experimental group significantly increased responsiveness, and their children's developmental quotient increased forty-seven percent. Mothers in the control group did not significantly increase responsivity, and their children's developmental quotient only increased seven percent. The responsivity dimensions in Figure 1 provide functional guidelines for interacting with young children and upon which to base ECS. Although, the dimensions are always enveloped in the systems and cultures surrounding each child and vary accordingly, they represent essential, universal aspects of healthy development, providing support that the RT paradigm could be adapted effectively in the current study.

Section 2.4.1 included general findings and research specifically using the RT paradigm to show caregivers have the most opportunities for the type of responsive interactions described by researchers to promote development and build relationships even when their children are receiving other services or schooling. It also included findings using the RT paradigm that indicate caregivers interaction styles are the ones that propel a child's rate of development more than the styles of teachers in special education classrooms, whether the instructors used

developmental, didactic, or naturalistic instructional models (Mahoney et al., 2004). These findings support the strength-based, family-centered best practice promoted by this dissertation.

Section 2.4.2 included general findings, paradigm comparisons, and specific RT research data that both evidences and describes the second best practice of providing relationship-based service delivery and all that entails. The research RT research explored in that section described the need to focus these relationship-based practices on enhancing pivotal behaviors and not just discrete skills as did the current study. It also provided evidence that such a focus could improve the communication, cognitive, and personal social domain scores of young children with developmental disabilities, ASD, and PDD (Mahoney & Perales, 2005).

RT is built upon the third best practice outlined in this dissertation that states enhancing responsivity and responsive interactions should be a primary focus of service delivery for young children. Section 2.4.3 explored the current literature to support this concept because it is the fundamental one underlying the entire RT paradigm used in current study. It also described cultural variations in this fundamental premise in order to adhere to the cultural ubiquity theme detailed in Section 2.3.

This section concluded by building upon the themes and practices explored in Chapter 2 with findings and concepts specific to the use of the RT paradigm. It did so by first clarifying the method in which the RT paradigm is theorized to increase developmental outcomes by promoting the operationalized elements of responsivity and promoting pivotal behaviors (see Figures 1 and 2). Additional data derived specifically from research using the RT paradigm was explored to further show the efficacy of the approach as displayed detailed in Section 2.5 (Mahoney et al., 2006). Further research using the RT paradigm was described how it has been

adapted successfully to serve children in Turkey and Korea with Down syndrome, ASD, intellectual disabilities, and generalized developmental delays. These data support the prediction of the current study that the RT paradigm could be adapted to serve predominantly Native Hawaiian communities.

Interestingly, prior to the study in 2005, Kim and Mahoney (2004) performed an observational analysis in Korea of mothers' *(n* = 30) interaction styles and the effects on engagement with children (M_{age} = 4.65 years) with and without disabilities. They found responsive interactions promoted the child's development by increasing the frequency and intensity that children used developmental learning processes (i.e., the pivotal behaviors in Table 4) in their daily routines. Their analysis included children with and without disabilities or delays. This is important because there is no research specifically showing the effects of RT on children without specific disorders or pronounced developmental delays. In fact, Mahoney and Nam (2011) published a chapter designed to comprehensively explore such "Parenting Models of Developmental Intervention" in which they report the "interventions have been reported with a wide range of children including preterm children, children with delayed language development, and children with a variety of disabilities including [Down syndrome], ASD, and other moderate to severe disabilities (p. 97). Nowhere do they mention children with less pronounced delays or who are at-risk because of environmental factors. However, their findings combined with the literature explored that evidence the fundamental premises of the RT paradigm support the plausibility that it can be used to serve children both without defined disabilities, with "mild to moderate" delays, or who are at-risk of falling behind because of environmental factors. This is important to the current study because its sample included children with a diverse range of abilities. As will be discussed in Chapter 3, the current study did not require a pre-existing

diagnosis in order to serve those undiagnosed, those weary of labels that come with diagnoses, and those in at-risk environments. This is the first research using the RT paradigm to take this approach.

The theoretical foundations outlined in this literature review elucidate some of the controversies and issues in the general literature regarding early childhood services. While this research is designed to address the specific needs of local communities, it also adds to the overall data concerning best practices for helping all children reach their own full potential. This obviously cannot be answered by one research paradigm. Thus, it is important that research such as this be conducted so that it can be compared to other methodologies and used to either support or refute claims of "best practices."

This review also explored research regarding many cultural similarities and differences in developmental phenomena to help emphasize the theme of understanding the importance of early childhood (Section 2.4.1) and viewing development as a dynamic, transactional system that occurs from within family and cultural systems (Sections 2.4.2 & 2.4.3). These themes and best practices guided the researcher in adapting the RT paradigm to effectively serve our populations and avoid a "one size fits all" approach that has plagued early childhood services in the past. The themes, best practices, findings, and limitations may help provide effective ECS designed to help all children reach their own full potential.

CHAPTER 3

METHODS

In September of 2011, SPIRIT was funded by a grant from the US Department of Education's Native Hawaiian Program. As Project Coordinator and Co-Principal Investigator, I designed and led all facets of the applied research project. The RT paradigm was chosen based upon the developmentally appropriate, empirically supported data and concepts explored thoroughly in Chapter 2. Furthermore, there is evidence that RT can be adapted to other, more collective cultures outside of the continental United States as does the current study (see Section 2.5 for details).

However, it had never been used within naturalistic settings in Hawai‘i, within predominantly Native Hawaiian communities, or with such a broad definitions of participants with general needs or who are at-risk because of biological or environmental factors. I was cognizant of the importance of ensuring that the paradigm was adapted to effectively serve these communities and that the curriculum was implemented in a culturally appropriate manner. The themes and best practices outlined in Chapter 2 were useful for guiding this unique, complex approach to ECS implementation as discussed in Sections 3.3 and 3.4 of the current chapter.

Project SPIRIT used the RT paradigm to serve families with children birth to five-years-old who were developmentally delayed or at risk of falling behind because of biological or environmental risk factors. The study focused on populations in low-SES, predominantly Native Hawaiian communities on O‘ahu. The program's home visitors used the RT paradigm to individualize a program for each family based on their own strengths, needs, and desires. The general research question of this study is whether the RT paradigm could be adapted to serve

low-SES, predominantly Native Hawaiian communities by strengthening caregiver-child relationships and improving the children's cognitive, communicative, social-emotional, and overall developmental functioning. Specifically, the research question will be answered by the following set of hypotheses described in more detail in Section 3.5.

1) The developmental trajectories of children who complete the program would significantly improve;
2) Program completion would promote responsive caregiver-child interactions;
3) High levels of depression would negatively correlate with program effectiveness;
4) Caregivers who complete the program would report stronger relationships with their child, enhanced parenting and teaching skills, inclusion of their cultural values, and overall satisfaction with the program.

Section 3.1: Recruitment and Participants

Perhaps the most difficult challenges in this program were recruiting and retaining participants in a long program that required active participation and addressed the sensitive topics of parenting and nurturing with no financial incentives. An invaluable part of recruiting families in the predominantly Native Hawaiian served communities was emphasizing the involvement and empowerment of the family and local community. If families, community members, and helping professionals become stakeholders, a program is more likely to be successful and sustainable (Hur, 2006; Rivera & Tharp, 2006). Thus, we made great efforts to involve members of the local communities. We conducted group parenting classes on our own, with our official partner, Alu Like, Inc., at local homeless shelters, and transitional housing developments. Although these group events are outside the scope of this study, they were used to

recruit attendees who were interested in the more individualized program analyzed by the current study as will be discussed further in this chapter.

We also attended many neighborhood events and community resource fairs to build a presence in the communities and directly recruit families. Project staff wore shirts with the SPIRIT logo, posted signs, and created activities (e.g., child-centered play activities) and materials (e.g., small soaps molded into a shape of a turtle in a bag branded with the SPIRIT logo) to attract potential participants. When community members approached our booth, we engaged them, gave them a brochure, explained the program, and asked them to write their contact information on a log so we could contact them after the event. In addition, project staff both attended and provided cross training and service collaboration meetings with many local community and governmental organizations. We worked with them to help fill gaps and provide services for those most at-risk and in-need. We attained several letters of support from partners such as the Department of Health & Safety, Child & Family Services, Zero-to-Three Court, the State of Hawai‘i Part C Early Intervention Program, Hawai‘i Infant Mental Health Association, homeless and transitional shelters, and other community organizations. They provided referrals and offered testimony to our sustained efforts to build local capacity by providing quality services. Diverse organizations from those providing state sponsored child services to grassroots groups with cultural emphases agreed to support SPIRIT and help attain funding to continue what they saw as a beneficial program (see Appendix K for an example).

SPIRIT was designed to fill service gaps and to help populations and communities most in need. Although it would be unethical to exclude participants based on race, we were funded by the Federal Native Hawaiian Programs Act so we used data to isolate low-SES areas with high concentration of Native Hawaiians most in need of our services because of high risk factors (see

Appendix J). Native Hawaiians as a general group are a population in need of services like SPIRIT. In addition to the data explored in Chapter 1 and Appendix J, Native Hawaiians represented 25% of the population receiving DOE Special Education services in Hawai‘i in 2011 despite being only roughly 10% of the population (Hawai‘i Special Education Advisory Council, 2013). Of those receiving the services, 70% fall in the category of general developmental delay as compared to the 11 other disability categories. Therefore, it was vital to go beyond specific diagnostic labels and design a service paradigm that identified and served participants that may not qualify for already scarce services requiring a specific diagnosis or more extreme inclusion requirements (Johnson et al., 2011). For example, the state changed the requirements to qualify for early childhood services from -1 standard deviation across at least two developmental domains to -1.5 standard deviations (Hawai‘i Special Education Advisory Council, 2013). This meant many children who needed help no longer were eligible to receive services (Johnson et al., 2011). In fact, the Hawai‘i IDEA Part C Early Intervention Program sent many of the children they could no longer serve to Project SPIRIT.

The program used existing data to choose communities that included large Native Hawaiian populations and evidence of high environmental at-risk factors. The communities we targeted in Wai‘anae, Nānākuli, and Waimānalo have the highest concentrations of Native Hawaiian children under eight-years-old on O‘ahu (see Appendix J, Figure 8). As shown, the communities selected include large proportions of Native Hawaiian families with young children, and the community profiles indicate high environmental risk factors (see Appendix J, Table 12). SPIRIT accepted all participants residing in these designated low-SES, predominantly Native Hawaiian communities because of either their biological and/or the environmental risk factors described in Appendix J. This is important because many of the children that need help

have not had the appropriate developmental assessments so they are not aware of developmental delays or indicators that may put them at-risk of falling behind. For example, under 40% of parents surveyed in Hawai‘i in 2011-12 reported their child was not screened for developmental, behavioral, or social delays in the past 12 months (Child and Adolescent Health Measures Initiative, 2011/2012). That statistic included the entire state, so it could be assumed worse for low-SES families given the extra stressors and barriers. The same survey also showed that just over 30% of parents in Hawai‘i reported moderate or high levels of concern that their child was at-risk for developmental, social, or behavioral delay. These indicators point to the likelihood that many children in need are not being identified. Without the proper identification, they are not receiving the help they need to optimally develop. Thus, SPIRIT accepted everyone in the designated at-risk communities who felt the need to participate. Some referrals outside of these communities were accepted if they had developmental concerns and the child was of at least partial Native Hawaiian descent.

Specialists conducted the same comprehensive developmental assessment (i.e., BDI-2) used by the State of Hawai‘i Part C Early Intervention Program to identify eligibility (see Sections 3.2 - 3.4). However, program participation was not restricted by the strict criteria used by the state to include participants with less significant delays or who might be environmentally at-risk. As mentioned, the state adjusted their cutoff criteria from -1 to -1.5 standard deviations across at least two developmental domains or sub-domains. Furthermore, children age out of their program when they turn four-years-old, and they do not qualify for comparable services until they enter the public school system. It was important to design a program to help fill these critical gaps in service delivery.

This type of applied research involves vulnerable populations and sensitive information so all precautions were taken to follow ethical research and service guidelines. The original University of Hawai‘i at Mānoa Committee on Human Subjects Institutional Review Board application was approved on September 27, 2011 (see Appendix C). The informed consent document was approved by the IRB and included extra precautions by including an additional consent for video recording (see Appendix D). A separate consent was developed to authorize the sharing of confidential information with partner organizations from which we attained referrals (see Appendix D). It is important to note here that ethical guidelines where adhered to in the recruitment of participants, but Sections 3.3 and 3.4 describe these procedures in more detail.

As stated, recruitment and retention was perhaps the most difficult component of this program. There were no tangible incentives to recruit families or keep them in the lengthy, interactive program. This was especially difficult in the beginning of the program while building relationships in the communities and with partner agencies. In the first year, we were eager to find participates and would enter families who were only mildly interested in our services in our database. The database was used to keep track of not only active clients, but also those that showed some element of interest so we could follow up with them after gaining their contact information. Therefore, some of these “participants:” a) never signed consents or began the program, b) signed consents and completed some/all of the initial assessments but never participated in program services, c) engaged in services but dropped out before completing the 24 sessions. It is important to operationally define these groups before they can be described in more detail.

The “Completed Program” or CP cohort (n = 44) is comprised of participants who completed all pre-/post-assessments and all 24 service sessions. This cohort is the focus of the current study because it is designed to gauge the effects of program completion as described in the research questions and hypotheses. Therefore, they are the only ones included in the data analysis, results, and discussion. This section will describe some of the differences between those that completed the program and those that did not.

The “Total Dropouts” or TD (n = 70) cohort is comprised of any “participant” who was entered into the spirit database at any time but did not complete the program. “Participant” is in quotations when referencing this group because they may or may not have actually engaged in the program assessments or services as described above. Thus, a third cohort classifies those in the TD group who more actively engaged in the program but did not complete it. The “Engaged Dropouts” or ED (n = 26) cohort is defined as participants who signed all consents, completed all pre-assessments, and attended at least three service sessions. As can be seen in more detail in Table 5, there were 114 total “participants” entered into the SPIRIT database during the program. Of these, 44 completed the program and 70 did not. Of the 70 who did not complete, 26 fell into the ED category.

Table 5.

Number of Participants Completing the Program and Reasons for Closing (N = 114)

Completed Program	44
Total Dropouts (Engaged Dropouts)*	70 (26)
Declined Services/Withdrew	37 (18)
No Reason/Unable to Contact	21 (2)
Fidelity Issue	7 (1)
Program Closed	5 (5)
Engaged Dropouts - Reason For Closing	
Not Enough Time	10
Program Closed (Funding)	5
Moved	3
Felt Program Was Not Needed	3
Employment Change	2
No Reason Given/Unable to Contact	2
Fidelity Issue	1

*Note: Reported in raw numbers for Total Dropouts first and then Engaged Dropouts in parentheses.

At first glance, it seems as if 61.4% of all participants dropped out of the program before completion. While these types of long, interactive programs do often have high dropout rates, this percentage is not a complete reflection of those that left the program because 62.9% of the TD never completed enrollment procedures. Therefore, if the ED (n = 26) are added to the number that completed the program (n = 44), the total participants that actually "engaged" in the program equals 70, and the dropout rate falls to 37.1%. As shown in Table 5, most of the total and engaged dropouts formally withdrew, declined services, or simply were unable to be contacted. Seven were removed because of issues with either program service (n = 6) or assessment fidelity (n = 1) as detailed in Section 3.4. Only the participant with the assessment related fidelity issues was included in the ED cohort because the participant completed all 24 sessions. More specific reasons for closing were documented for the ED cohort. As can be seen in Table 5, the largest number of them reported that they no longer had enough time to participate in the interactive program. The next largest group was those who were active when

the program closed because of lack of funding. None of them reported leaving the program because they were unsatisfied with the program or home visitor. However, the program was a relationship-based paradigm so they may have been reluctant to report this, and perhaps these reasons are enveloped within the ones categorized as “not enough time,” “felt the program was not needed,” or “no reason given/unable to contact.” With that said, I personally followed up with most of them to inquire further, and the reason I heard most was related to not having enough time in general or changes in time availability such as employment change or new responsibilities that emerged.

It is important to further describe the group differences between those that completed the program and those that did not. Although an empirical analysis of these differences is outside the scope of the current study, Table 6 displays some of the primary demographic variables describing the primary participant (the child) and program participation. Appendix M also provides descriptions of group difference in household variables such as income, structure, and caregiver descriptors (e.g., age, education level).

Table 6.

Group Comparisons for Descriptive and Dependent Variables

	CP (n = 44)	**TD** (n = 70)	**ED** (n = 26)
Descriptive Variables			
Child Age in Months			
M (SD)	53 (26.62)	62 (29.44)	28.83 (12.71)
Child Gender			
Male (%)	56.8	49.3	61.5
Female (%)	43.2	50.7	38.5
Child Ethnicity			
Nat HI*	95.5	82.1**	76.9
Other Pacific Islander	2.25	10.7	15.4
Asian + Caucasian	2.25	5.4	3.8
Asian	0	1.8	3.8
Child – Other Services			
Yes (%)	43.2	38.9	40
No (%)	56.8	61.1***	60
Program Participation			
Weeks in Program (*M*)	43.12	N/A	30.48
Sessions Completed	24****	N/A	8.4 (*M)*
Dependent Variables			
Child BDI Z Score			
Total	.39	N/A	.75
Communication	.31	N/A	.76
Personal-Social	.59	N/A	.74
Cognition	-.20	N/A	.33
Caregiver CESD Score			
M (SD)	11.71 (9.58)	17.74 (14.18)	16.58 (14.01)

*Many reported several ethnicities race. Native HI includes all reporting any Native HI.
**Calculated as % of the total who reported this stat (n = 56)
***Calculated as % of the total who reported this stat (n = 54)
****All completed exactly 24 sessions

An empirical analysis is outside the scope the current study in which the results are based upon the outcomes of participants who completed the program (see Chapters 4 -5), but there are some interesting variables to describe. While the children's age differences and variances in the CP and TD cohorts are relatively small, the children in the ED group were quite a bit younger and with less variance. They also tended to be male more than the other

groups. It is not possible to determine a reason for these differences, and they could be random considering it is such a small group.

Interestingly, the children who were reported to be of at least partial Native Hawaiian descent were more likely to complete the program as they made up 95.5% of the CP cohort. They represented the smallest percentage of the ED group. While definitive reasons cannot be provided for this difference, the program's focus on adaption to predominantly Native Hawaiian communities may have played a role.

Furthermore, the ED cohort are less slightly less likely to be engaged in other services and began with higher ability levels across all domains as measured by the pre-assessment BDI-2 results. Therefore, perhaps their need was not worth such a large investment of time, especially considering the group completed only 8.4 sessions on average, and fifty percent of them reported to dropout because they did not have enough time or because they felt the "program was not needed." The most interesting variables are the results of the CES-D scores that screened for caregiver depression symptomology. As will be discussed in Chapters 4 and 5, the CP group averaged 11.71, which is below the CES-D cutoff score of 16 used to delineate those that may be at-risk for clinical depression. Both the TD and the ED cohorts were slightly above this cutoff score. Although findings related to the effects of maternal depression in home visiting programs are mixed, some researchers have postulated that "[d]epression might make it hard for a mother to develop a working relationship with her home visitor, keep visits, and participate fully in them" (McFarlane, Crowne, Burrell, & Duggan, 2014, p. 53). While no definitive conclusions are possible, this may be a factor related to not entering or completing such an interactive program based primarily upon increasing responsive interactions.

Section 3.2: Measures

This section describes the instruments used to answer the primary research questions and hypotheses detailed further in Section 3.5. The list below describes the instruments, why they were selected, and how they were utilized. The outcomes will be discussed in the sections and chapters that follow.

Battelle Developmental Inventory, Second Edition: The primary research question is whether the program significantly improved the developmental trajectories of the children who participated. This fundamental question could only be addressed using a valid, reliable assessment tool. Although the full length BDI-2 (see Appendix H for overview) can take more time to administer than other tools (approximately 60 - 90 minutes), it was chosen for several reasons. It is a comprehensive tool with a history in the literature of being used by education and intervention programs to "determine where on the developmental trajectory a child is functioning" and for "monitoring student progress on short- and long-term bases" (Alfonso, Rentz, & Chung, 2010, p. 22-23).

It is comprehensive because it measures the five developmental domains and thirteen sub-domains detailed in Appendix H. It was normed using 2500 children in 30 states including Hawai‘i (Newborg, 2005). It has a test-retest reliability of .93 for two-year-olds and .94 for four-year-olds (Newborg, 2005). The convergent validity with the Vineland and other major assessment tools range from .60 to .75 (Newborg, 2005). It has been used in many applied programs and research-based journal articles (Newborg, 2005), and it was independently evaluated in the Journal of Early Childhood and Infant Psychology (Alfonso et al., 2010). The analysis produced "exemplary" marks for reliability related to its internal consistency and test-

retest stability. The BDI-2 also received “notable” results regarding its content, criterion, and construct validity. The tool also received top marks in the standardization sample and procedures.

The State of Hawai‘i Part C Early Intervention Program that served the same communities as the current study also used the BDI-2 for assessing both eligibility and progress. This allowed us to work with them to fill service gaps by sharing information about participants who did not meet their newly changed, more restrictive eligibility criteria. Furthermore, the BDI-2 included a Rasch-based measurement called the Change Sensitive Score (CSS) that is more reflective of actual changes in a child’s ability level than the *Z* scores that compare a child to broad developmental norms. The measurement uses the same transformation of the Rasch logit metric as the W or metric in the Woodcock-Johnson IV to develop a linear transformation on an equal interval scale so that score differences are equitable domains and sub-domains. LaForte (2014) reported that “[t]his type of Rasch-based metric is ideally suited for use in identifying delay, tracking progress, and the aggregate reporting required of state agencies serving young children with developmental delay. Unlike most norm-referenced methods of identification, the CSSs are not influenced by the shape of the score district from a particular normative sample; rather, they maintain their meaning across the entire range of ability” (p. 20). It was for these reasons the CSS were chosen as the primary indicators of changes in developmental trajectories for program participants. However, the *Z* scores are reported descriptively in the Results section because they will be useful for describing group differences in the Discussion.

Maternal Behavior Rating Scale: The second set of hypotheses detailed in Section 3.5 attempt to indicate program effectiveness as per the impact of the curriculum objectives and strategies within the caregiver-child interaction dyad. Video interactions were coded using the

Maternal Behavior Rating Scale or MBRS to provide supporting evidence that the program likely influenced the developmental outcomes although cause-and-effect inferences cannot be made in this type of naturalistic, applied design without a control group.

Prior to beginning the program and upon completion, caregivers were video recorded for three to five minutes while they interacted or played with their child. The only instruction given was for them to "interact or play with your child as you normally would." Videos of the participants interacting were completed pre- and post-intervention. They were analyzed using a reliable, valid rating scale created by the developers of the RT paradigm. The scale was named the "Maternal" Behavior Rating Scale by Mahoney, Powell, and Finger (1986) because the field and their research emphasized the mother's role in child rearing. Although this research is different than most because it includes all "caregivers," the MBRS remains applicable because it is designed to assess a program's impact on interactive variables emphasized in the curriculum because of their importance for promoting children's developmental outcomes (Boyce, Marfo, Mahoney, Spiker, Price, & Taylor, 1996; Mahoney, Boyce, Fewell, & Spiker, 1998; Mahoney et al., 1986). Mahoney, the instrument developer, has published at least 13 peer-reviewed studies using the MBRS, as have researchers other than the instrument developer (Chiarello, Huntington, &Bundy, 2006; Mayers, Hager-Budny, & Buckner, 2008; Moore, Saylor, & Boyce, 1998). Moore et al. (1998) reported moderate to high levels of correlation between the MBRS and similar peer-reviewed parent rating scales.

The purpose of the scale is to measure 12 points reflecting curriculum objectives and four "Interactive Style Factors" describing caregiver-child interaction qualities (see Appendix I). This scale can be used for program evaluation because the post-intervention videos should show a significant improvement in the scale items that measure program objectives. It can also help in

the interpretation of developmental outcome measurements because research has shown the caregiver-child interactive variables are associated with the child's developmental growth (Mahoney et al., 1998; Mahoney, et al., 1986). Furthermore, MBRS ratings have been shown to be stable over time for caregivers not involved in intervention paradigms (Mahoney & Bella, 1998), but they are sensitive to changes in caregiver interactions prompted through successful intervention strategies. Simply, the caregivers should show increased engagement in the developmentally appropriate use of Responsive and Child Oriented, Affect and Animation, Achievement Orientation, and Directive Interactive Style Factors as these are the objectives of the curriculum (see Appendix I for a detailed description of Interactive Style Factors). To help indicate program effectiveness, these Interactive Style Factors should show significant improvement from pre to post video ratings.

Center for Epidemiologic Studies Depression Scale (CES-D): The CES-D is a frequently used[4], self-report scale that screens for the symptoms of clinical depression (Radloff, 1977). As shown in Appendix A, it measures 20 items associated with clinical depression. Its validity has been repeatedly established through correlation with clinical ratings of depression and many other self-report tools. Mahoney et al. (2014) reported the CES-D having a high Cronbach alpha of .85 in the community samples applicable to their RT research. It should be noted however, that any measure, especially a screening tool, is limited in it sensitivity to different cultural variables and is not designed for diagnosis of clinical depression. The CES-D screening tool includes a cutoff score of 16 in which those scoring higher may be indicating depressive

[4] It is cited by over 29,000 journal articles and has been used in previous RT research to measure the negative correlation between high indicators of depression and program effectiveness because caregivers with these symptoms are hypothesized to be less responsive to their children (Mahoney et al., 2006; Mahoney et al., 2014).

symptomology. This measure was included in the current study because some of the existing research implementing the RT paradigm found that overall developmental outcomes were not significantly improved for participants scoring high on the CES-D screener

Post-Participation Caregiver Survey: Because the primary objective of this study was to use a caregiver-mediated approach to improve responsive interactions that drive developmental outcomes, the caregivers own reports of the program effectiveness were important data to help link the program to the developmental outcomes, especially because the before-and-after design prevented definitive cause-and-effect inferences. The final set of research questions was measured by the post-participation survey (see Appendix B) completed anonymously upon program completion. There are 10, 5-point Likert scale questions that quantitatively measure overall participant satisfaction when totaled. However, there are four themes within the questions that allow for thematic analysis. Questions 1, 2, and 9 rated their feedback regarding the effectiveness and quality of the program regarding the process, curriculum, and home visitors. Questions 3 - 5 measured how much they thought the program strengthened their relationship with their child and increased the quantity and quality of their responsive interactions and play. Questions 6 - 8 measured how much they thought the program helped them enhance their general parenting and "teaching" skills. Question 10 measured how well they thought the program was open to and respectful of their cultural values, needs, and desires.

Beyond the qualitative scores, each question also had a section that afforded them the voluntary option to add any qualitative input. In addition, the back of the survey asked for open-ended input regarding "any useful information whether positive or critical." Although 46 surveys were returned (two extra ones from caregivers other than the primary participant), the qualitative feedback sections were marked "optional," and there was not an extensive amount of qualitative

information to explore empirically. Thus, the quantitative ratings are the primary focus of the data analysis in the Results section, and the qualitative feedback will be used to add richness in detail to the discussion in Chapter 5. All the qualitative feedback received throughout the program is listed after the survey itself in Appendix B so the reader can cross-reference the feedback with the questions in the survey. It should be noted that the survey includes feedback from only those that completed the program.

Section 3.3: Program Procedures

The research and examples in Section 2.1 were used to emphasize the importance of early childhood and ECS. Some of these statistics and concepts were included in the SPIRIT program brochure and often used by the SPIRIT team to relay this critical point to every caregiver and professional possible. This was not just an important theoretical point, but also one that aided program participation and helped sustain caregiver motivation as discussed in Section 2.1. The next step was to use the systems themes outlined in Section 2.2 to help home visitors understand all the players and variables important to consider to help a child reach their own full potential. Understanding this dynamic, transactional, layered system helped them understand the RT paradigm beyond rote curriculum adherence. This is an important understanding because it helped us provide more family-centered services and adapt the curriculum more effectively to individual, family, and cultural variables. The cultural ubiquity theme of Section 2.3 was a constant and ubiquitous theme emphasized throughout every aspect of Project SPIRIT. It was critical that we not assume we knew everything about the Hawaiian and local cultures we served or be perceived as outsiders coming in with a “one size fits all,” “I know what is best for you” approach, especially considering the sociohistorical context of the Hawaiian Islands. Thus, our official partnership with the longstanding Native Hawaiian organization, Alu Like Inc., was

imperative to the success of the project. They provided us with some of the home visitors and were our primary consultants regarding the cultural dynamics of the people and communities served.

Before considering cultural variances and adaptations, it was imperative to understand the RT paradigm thoroughly so the program developers were contracted to provide an initial, four-day training that included in-depth exploration of the essential theories and principles underlying the RT paradigm. The training was also designed to teach the curriculum and service components using didactic instruction, apprenticeship-based practice with families, reflective supervision, and group video analysis. All six home visitors employed throughout the project were either of Native Hawaiian descent, from Oʻahu, or with over 20 years of work experience with local populations. This experience was critical for assuring the people with the most contact with the families were able to communicate with and relate to them effectively. Staff was comprised of bachelor's and master's degree level employees with very different backgrounds including clinical psychology, community psychology, education, social work, and Native Hawaiian studies. None of them had a developmental background and only three had previous experience working with families and pre-school children in their homes using a developmental-based curriculum. Thus, the initial training was not enough to prepare such a diverse staff to meet such varied needs so program procedures were designed to include ongoing trainings, weekly team meetings, and periodic case reviews.

Before discussing those, it is important to describe the manner in which their initial training was reinforced with reflective supervision and quality assurance monitoring. Initially, an apprenticeship model was implemented after a home visitor and I felt they had received enough basic training regarding the curriculum, service, and documentation procedures. I would attend

sessions in the homes of their participants to guide and observe the program and session fidelity. Then, we would reflect upon both their strengths and weaknesses after the session and in routine individual/group supervisions. Once we both were confident in their ability to provide high-quality services, they were to perform each session on their own and bring any issues to me or the group as needed. They could also request that I attend any session or meeting in which they needed help solving problems (e.g., behavioral issues) or any other support (e.g., dealing with difficult participants or situations). Finally, I would continue to perform random "spot checks" throughout the program, and every participant had my contact information in case they needed to reach out to me for any reason (see Appendix F, Section 3 for more detail).

This process worked well overall with one major exception. At the beginning of the project, we employed a graduate assistant from the University of Hawai‘i at Mānoa Social Work program. I spent the semester attempting to train her to an acceptable level of providing sufficient service fidelity. I performed many "spot checks" along the way, and at the end of the semester, I attended several of her sessions with each of her participant. She failed to show the proper level of quality expected, and a review of her documentation created more concerns regarding curriculum and procedure implementation. Thus, her graduate assistantship was not renewed following semester. Before any of the outcomes were measured, the decision was made to exclude all six of her participants from the completed dataset (n = 44) described in Section 3.1. They were also left out of the "engaged dropouts" (n = 26) explored in Section 3.1 because they never properly engaged in the actual program and because of the lack of fidelity within the data collection and documentation processes.

The same training, apprenticeship, supervision, and "spot check" processes were used to ensure the fidelity of the BDI-2 process. A specialist was hired had over 20 years experience

teaching within the same groups, population, and communities in the current study. He also had experience conducting the BDI-1 for the state of Hawai‘i along with several other relevant qualifications. Having been officially trained in graduate school to perform the BDI-2, I was able to help the specialist learn it and the new online assessment and data collection tools using the resources provided by the publishing company. This will be discussed further in Section 3.4 but is introduced here because of the relevant fidelity issue. One participant who completed the program was left out of the completed dataset before any outcome analysis was performed because the specialist and I were not satisfied the child's demeanor, mood, and behavior during the session allowed for an accurate assessment of his abilities. We were forced to rush the session because the family was moving away from the island, and they reported not having enough time when we attempted to reschedule the assessment. Thus, this participant is included in both the total dropouts and the "engaged dropouts" categories described in Section 3.1.

We began each weekly team meeting by sharing "success stories" and family strengths. This was important for not only maintaining team morale, but also for emphasizing the strength-based, family-centered best practices discussed in Section 4.1. Then, we mostly focused on the details needed to implement the RT paradigm inside participants' naturalistic environments and individualize it to particular families. We also used case reviews to discuss how to adjust the procedures and curriculum to adhere to the themes and best practices outlined in Chapter 2. In addition, one of our team members with knowledge of Hawaiian and local culture would help the team reflect upon how curriculum and procedure variables might pertain to and manifest within our communities adhering to the cultural ubiquity theme of Section 2.3. For example, if discussing components related to responsivity (Section 4.3.3), I would cover the developmental aspects and how they applied to the curriculum and program procedures. Next, I would introduce

general cultural variances like those explored in Chapter 2, and then a team member more knowledgeable of local culture would lead a discussion regarding how the concept might apply to our communities. Luckily, one of the first employees from Alu Like was a Hawaiian woman with a degree in Native Hawaiian Studies that spoke the language, lived the culture, and had access to the mana`o (knowledge) of the Alu Like organization. She stayed for the entire project and served as the primary trainer and reference regarding Hawaiian, Polynesian, and local culture. We also attended several outside trainings regarding not just Hawaiian and Polynesian cultures, but also addressing the specific communities we served that could be quite different from one another.

It is important to have a working knowledge of the macroculture surrounding the communities being served. This is why we chose the staff, partnerships, and training processes aforementioned. Such knowledge is vital for building relationships in the communities and for providing top-down, general guidance for program procedures and adaptations. A few of these general cultural variations need to be discussed here because they shaped the overall program procedures and service processes. Designing services around a family strengths and cultural preferences is a best practice discussed throughout this dissertation. These family-centered service recommendations yield an important macrocultural variation concerning the operational definitions of “family” and “caregivers.” Local Hawaiian and Pacific Islander cultures have a broad meaning of “family” and a shared responsibility for caregiving (Onikama et al., 1998). In the current study, we used the definition provided by Onikama et al. (1998) to include “all who have responsibility for care and well-being of children, such as mothers, fathers, grandparents, foster parents, siblings, aunts, uncles, and non-custodial parents” (p. 2). This is why this dissertation consistently uses the term “caregivers” in lieu of “parents.” This is more than

semantics. It is of practical significance because many participants in SPIRIT would not be included in a narrow definition of "parents." Thus, we adapted the RT paradigm's "parent-mediated" verbiage and concepts to "caregiver-mediated" ones to reflect the more broad definition above.

Furthermore, Hawaiian and Pacific Islander populations are historically more collective in nature than those served by previous research using the RT paradigm. For example, our communities included a significant amount of multi-generational living with child rearing responsibilities shared amongst the o`hana or family (e.g., grandparents, siblings, and close friends referred to as "aunties" or "uncles"). Sibling caregiving was another cultural characteristic to which our program had to carefully adapt. Older siblings often play a substantial role in rearing, socializing, and educating younger siblings (Maynard, 2002 and 2004; Rabain-Jamin, Maynard, & Greenfield, 2003; Roberts 1993; Weisner, 2002). Although older siblings of our primary participant were not the focus of our intervention, they, and any other caregivers present, were often included in our weekly sessions as we adhered to the culturally applicable, family-centered themes and best practices described in Sections 2.3 and 2.4. We also attained participants via referrals from organizations such as Child Welfare Services so some of them lived with extended family members or resource caregivers. Thus, we defined our "caregiver-mediated" approach to include anyone who was spending significant amounts of time participating in child rearing duties related to the primary participant enrolled in our program. This was a top-down adaptation guided by the macroculture surrounding our communities.

Another top-down adaptation based on our communities' macroculture was our adherence to a naturalistic, community-based program paradigm. The communities served by the current study were relatively far from the University, and many of the lower SES participants did

not have the resources to travel to our facilities for 24 weekly session. These issues are often barriers for families from low-SES environments that prevent them from receiving the help they need (Johnson et al., 2011). Thus, we traveled to them they were to engage in the weekly sessions outlined in the next section. While this was an important program procedure, it did increase program costs. It also makes it very important to consider distances needed to travel when assigning home visitors and scheduling their weekly responsibilities. We used maps to plot where participants were located and how far they were from one another. We then attempted to assign those near one another to the same home visitor and schedule them on the same days when possible. It is also important that home visitors maintained effective communication with their participants and confirm appointments beforehand to minimize driving long distances for no reason. Each home visitor was given a cell phone, and texting was often the preferred method for communication.

As the examples above indicate, it is important to allow program procedures to be guided from the top-down by relevant macrosystem variables surrounding the communities being served. However, it equally important not to assume that a community or family is the same as another just because they fall within the same ethnic or community descriptors. The reality is that these variables manifest from the bottom-up differently in each household. Our communities were not the same because they were all “predominantly Native Hawaiian” or “low-SES” nor were each family within those communities. This is why it was critical that we use macro level knowledge to guide general program procedures but that we individualize them to each family from the bottom-up based on their specific needs, desires, and family-system variables. During every training and discussion, I would continuously emphasize the importance of program individualization, not to just the macrocultures surrounding our families but to that particular

family and child. As detailed in Section 2.4, the RT paradigm is based on the principals of individualizing the approach and curriculum to a particular child and family to empower them to strengthen relationships and interact in ways to promote learning and development. These principles provided the flexibility needed to adapt activities and procedures to not just a generalized macroculture but to a specific family.

A principal component of the RT paradigm is to individualize the program to strengthen existing relationships by accessing natural, everyday interactions of the family unit (Mahoney & MacDonald, 2007). Inserting developmental principals such as responsivity, joint attention, and social play inside daily routines and interactions allows caregivers to not just learn the skills in an effective manner, but also apply them on a daily basis (Mahoney & MacDonald, 2007). This is the key to the RT paradigm. Moreover, accessing daily routines and scripts inherently includes cultural variables important to that particular family as discussed in Sections 2.3 and 2.4. Because accessing the daily routines and scripts that already existed in their natural environment was so important, we minimized the amount of new toys or scripts introduced into the environment and family system. We explored what they already had and did on a daily basis so we could build upon them to promote responsive interactions, play, and the pivotal behaviors outlined in Section 2.4. Alu Like, Inc. and Native Hawaiian staff helped us gather/develop activities and language specific to the families to which these variables were important. For example, we would intertwine Hawaiian values and words in interactions and activities when applicable. We often brought boxes of shells, rocks, and sand for sensory and play activities. We developed social stories using pictures of them, their families, and their everyday environments and scripts. We also developed a play scenario revolving around the traditional Hawaiian activities like “pounding poi” or “makahiki” (traditional Hawaiian festival) such as “`ulu maika”

(similar to bowling but with natural materials). We intertwined these types of activities and the Hawaiian language with more Western based or modern activities when possible, but we always met them where they were, adhered to their desires, and individualized their specific program from the bottom-up relying heavily on their input. We emphasized that we were not there to tell them how to parent or drastically change their family routines and cultural norms. We were there to work as a team, understand their needs and desires, and help them achieve these goals by improving the responsivity and quality of the everyday interactions they shared with the child and family.

Section 3.4: Service Procedures

As soon as a new participant enrolled in Project SPIRIT, a home visitor was assigned to them to create a single point of contact so they could begin building a trusting relationship with the same person that would be guiding them through the program as outlined by the best practices in Chapter 2. This is important because we began modeling our relationship-based principles from the very beginning to build trust and program buy-in while minimizing the number of strangers with whom a participant would have to share intimate information or invite to their own home. Their home visitor would often spend the first visit engaging in the traditional Hawaiian script of “talking story” and getting to know the participant, child, and family. This also allowed us to learn important family and cultural details used to guide their individualized services. Once the participant agreed to participate and signed the informed consent, the home visitor would help them complete the demographic information collection form (see Appendix E) and complete all pre-assessments. The RTC was then combined with caregiver and family information to design an individualized program that included 24 sessions followed the service procedures described in the following sections.

Section 3.4.1: General service procedure framework. To successfully complete Project SPIRIT, participates were required to complete all pre- and post-assessments and a total of 24 RT sessions held once per week that will be described in the next section. In the traditional RT paradigm, the weekly sessions are approximately one hour in length. However, I had to allot 1.5 hours for each of our sessions because of the local "talk story" and relationship building cultural scripts, adhering to the theme of Section 2.3. That is, Hawaiian culture was traditionally and oral one in which taking the time to share "stories" or have discussions is an important cultural script for building a relationship with another person. This tradition is reflected in modern Hawaiian culture by the cultural norm of taking the time for "small talk" or to "talk story" before (and sometimes after) engaging in any "business." The importance of this concept is not easy to understand for many Western-influenced professionals, but it is a vital script to follow for establishing the type of trusting relationships necessary for our program's success. I had to explain this in writing to our federal funders in Washington D.C. because adding a half hour to every session reduced the overall number of families we could serve over a three-half-a-half year period. Although this indeed reduced the number of families we could serve, it was a necessary adaptation to adhere to the culturally applicable and relationship-based practices detailed by the best practice in Sections 2.3 and 2.4.

Before any RT sessions were conducted, a mandatory pre-intervention video was recorded to compare interaction variables to those in the post-intervention videos using the MBRS rating scale. The caregivers were instructed to "interact with their child as they normally would" and were filmed for three to five minutes playing with their child in their natural environment. If they stopped before the recording reached three minutes or asked what they were supposed to do, they were instructed to interact with their child as they normally

would. Although past research using this procedure introduced “developmentally appropriate” toys into the environment before videoing, SPIRIT emphasized naturalistic validity by minimizing the outside toys introduced. Therefore, the parents were instructed to interact or play with their child in the way they normally would and were given the opportunity to choose to use toys or not. Part of the program was to teach them to think developmentally which includes appropriate toy and activity selection so this is something they should learn along the way. Furthermore, many of our families did not have the types of toys a clinician would use in a therapy session or had their own culturally based tools, activities, and interaction routines. Because we were asking them to implement our program daily inside routine interactions and play, it was imperative that we did not give them activities or procedures that were not possible to maintain once we left. Because this was a caregiver-mediated process that they were expected to perform daily on their own, practicing during sessions with toys or activities they could not readily recreate undermine the program fundamentals. Thus, we were extremely careful and selective of the toys, tools, and activities we introduced into a setting or family during home visits and especially while videoing what is described to be natural, everyday interactions and activities. This increased naturalistic validity but caused some problems coding the MBRS, as will be discussed in Chapter 5.

After the pre-intervention video was recorded, the child received a full developmental assessment using the BDI-2. This would mostly occur before any RT sessions were conducted, but it was sometimes necessary to perform one or two sessions before performing the assessment. This was necessary when the caregivers were hesitant about the assessment or the home visitor felt the need to build momentum before the lengthy assessment. No more than two sessions were allowed before performing the BDI-2. The assessment was conducted in the

home or gathering place that allowed for minimal distractions by me and/or another specialist with experience and training using the instrument. My master's degree in Human Development in Early Childhood Intervention included formal training for performing the BDI-2. The primary assessment coordinator had not only taught for over 20 years and local early childhood environments, but he also had professional experience conducting BDI-I as an employee for the State of Hawai'i. We trained together to prepare for the implementation of the BDI-2 and performed the assessments together until I was sure that he was implementing sound, reliable practices. After such, we often worked together when facing difficult behavioral and/or environmental circumstances. I also performed periodic quality assurance "spot checks" and continued to perform some assessments throughout the entire program. We also conferred with one another and our team to address a few minor discrepancies or variations that may be culturally based. For example, we decided to change "squirrel" to "mongoose" on one of the activities to reflect the wildlife available in the child's natural environment. Although we followed the essence of the BDI-2 scripts designed to ensure that the assessor not lead the child or caregiver, we made some language adaptations when necessary to get a true reflection of child's ability level and avoid inaccurate assessments because of vernacular or colloquial differences. Although the BDI-2 often allows a score to be derived from either structured activities, observation, or caregiver interview, we performed the structured activities when possible, followed by direct observation, and then caregiver interview. We also documented detailed notes and gauged the child's activity and response levels. We followed the child's lead, embedded the assessment inside social play activities in their natural environment, and did not push the child to finish in one session. If we felt the child or family was not performing optimally, we did not hesitate to return at a better time. The results were recorded immediately

into the BDI-2 web-based software using a laptop with remote wireless internet access (see Appendix F, Section 1 for more detail). The software also calculated and stored all scores reducing human error and loss of data.

We also used a remotely accessible software application to guide the clinical portion of the program. The RT curriculum included proprietary software designed to aid program procedures. It helped them preparing by allowed them to efficiently print forms and tools to use in their upcoming sessions (see Appendix F, Section 2 for more detail). It also guided the home visitors through the program and helped them choose objectives individualized to their specific participants. The home visitors had the option to proceed through the curriculum in order, to use their professional judgment and caregiver feedback to choose objectives, or use parental exemplar statements preloaded into the software to suggest objectives and activities. This was extremely helpful and a representative of a hallmark of the RT paradigm - its flexibility that emphasizes individualization and the empowerment of the caregivers and professionals to focus on objectives that meet their and the child's needs. At our weekly training and case review meetings, we discussed how to use the software and curriculum effectively to individualize their programs to serve their current participants. They were trained to follow the standardized operation, service, and documentation procedures outlined in Appendix G.

The RT software not only helped the home visitors navigate the program and curriculum, but it also kept a record of the specific program objectives covered to help with planning or covering for home visitors when they were away. Home visitors were trained to use the "DAP" process for writing their weekly clinical reports. The DAP process stands for Data, Assessment, and Plan (see Appendix G for more detail). This provided a more

standardized approach for recording individualized session notes, which helped with clinical analysis, planning, and individualization. The RT software also provided another place to record qualitative information regarding weekly caregiver and home visitor feedback and observation. This was helpful when analyzing specific issues related to clinical work in the program fidelity (see Appendix G).

Post-intervention assessment data were collected upon completion of the 24 sessions detailed in the next section. A post-intervention video was recorded following the same procedures and instructions as the pre-intervention video. Then, the full BDI-2 (see Appendix H for overview) was administered using the child's chronological age to set baselines. Thus, the post-assessment was never exactly the same as the pre-assessment. It followed the developmental level of the child to gauge both baselines and outcomes. This is an important factor when using repeated measures comparing children's post-program outcomes to their pre-program outcomes.

The participants were also given a post-intervention feedback survey (see Section 3.2 and Appendix B). They were given a self-addressed, stamped envelope so they could complete it without the influence of the home visitor's presence. They were given the option to write or not to write their name on it although almost all of them did. If a client had been closed for three weeks and no feedback form was received, I followed up with a phone call and a visit to pick it up if needed. It is important to note that the surveys were designed to measure the feedback of those who finished the program. If participants dropped out, their reasons were collected verbally when possible and documented in our database. It is also important to note that there was a process for responding to difficult situations of concern to either the participants (e.g., complaints about the home visitor or process) or the home visitors (e.g.,

concerns of abuse or neglect). These procedures are dressed in more detail in Appendix F, Section 3.

Section 3.4.2: Weekly service procedures.

The RT paradigm maximizes the opportunities for the type of responsive, "serve and return" interactions evidenced in Section 2.4 to enhance relationships and promote development. Caregivers and families actively participate in weekly sessions with their child. The instructional paradigm used in each session is paramount to program success. It follows empirically derived processes by applying different modalities of complementary, reinforcing learning procedures. The process includes motivational and instructional strategies, application of skills, and feedback loops that promote learning based on both constructivist (Piaget, 1963; Vygotsky, 1978) and adult learning (Knowles, 1950) theories. It also allows professionals to continuously gauge comprehension to determine instructional style adaptation and curriculum progression.

Each session begins and ends with the FAP that outlines only a few objectives and strategies pulled from the RTC and individualized to coalesce with a family's needs, desires, and routine activities. Their weekly goal is to practice the strategies for just five minutes per day. This process does not overwhelm the family or alter their lives too much, thus promoting program adherence and sustainability. Each new session begins with feedback from the caregivers regarding the implementation of the previous week's FAP. This input determines whether to move forward and how fast to progress toward other objectives and strategies. This again promotes individualization and the family-centered principles described in Section 2.4. Critically, the session routine involves both didactic and conversational instruction, modeling, apprenticed practice, and feedback loops. The home visitor first listens and then explains

objectives with applied examples and concurrent feedback. Then, the professional demonstrates the strategies directly with the child and allows the caregiver(s) to practice directly with the child. Along the way, they reinforce strengths and finish with contingent feedback. Finally, they work collaboratively to determine specific times and routines in which to practice the strategies detailed in the weekly FAP described in Figure 4 (Mahoney, 2011).

Family Action Plan

- The heart of RT
- Individualized plan for parents to follow-through with information from session
- Developed collaboratively with parents
- Can include a variety of activities
    - Observation/Discussion
    - Practice – (Skill Development)
    - Integration into daily routine
    - Problem solve obstacles to RT
    - Incremental approach to change process
- Must be practical/feasible as related to cultural values, environment, and daily routines
- Sessions begin with continued discussion of how weekly goals were met & future direction

Figure 4. Description of The Family Action Plan in the RT curriculum.

The FAP described in Figure 4 is the plan of action the caregivers help devise for daily implementation of the strategies and concepts practiced in the weekly sessions. It is important that they develop this plan collaboratively with their home visitor to show their understanding and to determine how and when the strategies can be practiced in their daily routines and interactions. This also empowers them to be an active player in their program design and their child's development. Furthermore, it prompts the inclusion of family and cultural variables from the "bottom up" because the families themselves are prompted to determine what objectives and strategies to include and when/how to engage in the strategies within their existing routines and

interactions. Their “homework” was to practice these strategies for just five minutes per day and report back to the home visitors the following week in order to guide program progression and design the next week’s FAP. The idea is that the families will become more practiced, efficient, and motivated to interact in these manners when they see the effects of something they can do on a daily basis without altering their lives in an unsustainable manner (Mahoney & MacDonald, 2007).

The instructional paradigm used in each weekly session was a major factor proposed to contribute to successful outcomes. It applied different modalities of complementary, reinforcing learning procedures; including motivational and instructional strategies, application of skills, and feedback loops to promote learning. For example, each session began with caregivers’ feedback regarding how well they were able to practice the strategies and objectives outlined in the previous week’s FAP. This feedback determined whether to move forward and how fast to progress, promoting individualization and family-centered principles. If the caregivers were able to engage effectively their child using the strategies and felt their child made ample progress towards the objectives, then the home visitor was prepared to introduce new strategies and objectives to build upon the completed ones. However, if the caregivers were not able to practice them for whatever reason or they felt they or the child needed more practice, then the home visitor did not introduce new objectives. Instead, they would continue to discuss the objectives to ensure comprehension, tweak or alter the strategies based on the feedback, engage in the session routine to model and practice the strategies, and design a new FAP together. The home visitor would not move on to new objectives until the caregiver felt they understood the old ones and could practice them effectively in the future. This is an important procedure as some programs or professionals focus too much on pushing through a curriculum or covering as many objectives as

possible, but the most important factor is whether the objectives are fully comprehended and the strategies can be sustained in the future upon program completion.

The session routine outlined by the RTC also aided comprehension and sustainable learning because it involved collaboration, didactic and conversational instruction, modeling, apprenticed practice, and feedback loops. The home visitor first listened to the caregivers' input and feedback, and then taught objectives and strategies with examples that applied directly to them in their individualized program. Then, the home visitor got on the floor with the caregiver and child to demonstrate the strategies while providing concurrent feedback about what she was doing and how it applied their personalized FAP. Importantly, the home visitor would then prompt the caregiver(s) to practice directly with the child. Along the way, they reinforced strengths and shaped actions according to the specific objectives with contingent feedback while being careful not to disrupt the interactions or intervene too much. Following the apprenticed practice, the home visitor and the caregiver would reflect upon what they did, why they did it, what worked, and what did not work. The home visitor would ensure the caregiver understood the objectives and how they would help them and their child. Finally, they worked collaboratively on the following week's plan and determined specific times and routines to practice the collaboratively determined strategies for just a few minutes each day. These were written into that week's FAP, and the caregivers were given a daily chart upon which to document each day's "homework." The chart not only allowed the home visitor to see if participants were engaging in the daily interaction "homework," but it also provided a space for the caregiver to rate the effectiveness of the interactions while describing both strengths and weaknesses. The following week's session would begin by reviewing this chart in order to prompt caregiver feedback, gauge progress, and restart the weekly cycle described above.

This process allowed home visitors to continuously gauge caregiver comprehension to determine instructional style and curriculum progression. This is important because caregivers' "buy-in," learning, and implementation is what determines successful outcomes in a caregiver-mediated paradigm. We worked to empower caregivers to participate actively in strengthening their relationship with their child and helping them reach their own full potential. Active participation and empowerment helps to maximize retention and motivation fostering a "ripple" effect throughout the child's system across time (Bailey et al., 2011; Boettcher et al., 2003; Mahoney & Nam, 2011). As caregivers witnessed results and became practiced, they should have theoretically engaged in these interactions with their child(ren) more often and effectively. They should then be able to engage in these strategies more efficiently and/or develop new ones pertaining to the objectives they learned so that they can interact in manners that enhance relationships and developmental outcomes outside of the program sessions. Furthermore, they can continue these responsive interactions after program completion and across settings and time (see Sections 2.4 and 2.5). This is the theory behind caregiver-mediated interventions as in the current study as opposed to expert-driven ones that can be overly dependent on the activity of a professional as explored in Section 4.2. Home visitors were trained to constantly remind the caregivers that they were the experts concerning their family and child(ren), the ones that interact with one another the most, and the ones that are together long after professionals and teachers are gone.

Providing services that met the families wherever they were and included whoever was of importance to the child was an important part of the program design; however, this presented some procedural and methodological problems. The primary participant was the child referred to us by the caregiver(s) or one of our professional service partners (e.g. Child Welfare Services,

other early intervention programs, pre-schools, etc.) and at least one of the primary caregivers. A major difference between this program and previous RT research was the inclusion of all caregivers such as fathers, grandparents, aunts, uncles, and siblings when possible. We chose to adhere to the themes outlined in Chapter 2 and emphasize the cultural and naturalistic variables delineated above. However, this made it almost impossible to have consistent, uninterrupted dyads because of the housing and family structures. At times, we were not able to meet in a house for various reasons (e.g., caregiver preference, homelessness, drugs, crowded spaces, etc.) so we would meet in public places like parks and beaches. When we could meet in their house, there were often other family members and children around even if they were not officially in the program. This made our process and activities more group oriented than research using the RT paradigm. It also made some of the data collection difficult as will be discussed in Section 5.3. However, operating in these group and collective environments helped us maintain naturalistic validity, recruit other participants once they witnessed the positive effects, and adhere to the themes and best practices outlined in Chapter 2.

Section 3.5: Research Design and Data Analysis

This study implemented a naturalistic, applied, before-and-after design appropriate for testing the feasibility and benefits of adaptations to empirically tested interventions. Before-and-after studies are often used in intervention programs and comparative reviews when assigning a control group is problematic or unethical (Paulus, Dahabreh, Balk, Avendano, Lau, & Ip, 2014; William, Shadish, Cook, & Campbell, 2002). Assigning a control group in this research was not possible because of logistical and ethical concerns. One of the primary goals was to fill service gaps and help as many young children and families as possible. Many of these families had few or no other options, so we accepted all participants referred to us because of developmental or

environmental risk factors. This was an important approach because a fundamental message at the heart of this applied work as outlined in Section 2.1 is to promote helping children as early as possible. A waitlist control group was considered; however, there never was a waitlist because of difficulties with recruitment and retention. Furthermore, there was no alternate treatment to offer participants. A waitlist control without an alternate treatment to offer would promote a "wait and see" approach that early childhood professionals like myself are trying to eradicate because of the importance of even short periods of time in early childhood as described in Section 2.1. Thus, a before-and-after design utilized a reliable, comprehensive developmental assessment to gauge both the strengths and weaknesses of the child and to measure developmental progress pre- and post-intervention. Pre- and post-intervention videotaped interactions and the MBRS coding system were used to measure program impact on caregiver-child interaction style and quality as related to intervention objectives.

Importantly, participants were young children and the developmental assessment tool (i.e., BDI-2) measures baselines and trajectories compared to standardized developmental norms, so it "grows" with the young children and is used to assess the highest level of what they can accomplish. These facts dramatically reduce the possibility of pre- to post-test recall bias. The other validity concern for pre- to post-test paradigms is the response shift bias; an alteration of a subject's metric for answering questions because of a new conceptualization of a concept to which they are exposed (Klatt & Taylor-Powell, 2005). This is obviously of no concern for the young children, but it could apply to the caregivers participating in the program when they are providing our post-participation feedback and video recordings. However, SPIRIT was a caregiver-mediated paradigm designed to do just that, alter their understanding of the concepts within the RTC that were the focus of their intervention. Thus, this is not a significant concern as

per validity of the research design, especially considering the response shift bias has been hypothesized to underestimate program effectiveness if anything (Klatt & Taylor-Powell, 2005).

Some existing research of early childhood programs have found that depression moderates program engagement and outcomes, but other research do not find these effects (Mahoney, 2011; Mahoney et al., 2014; McFarlane, et al., 2014). Therefore, caregivers were screened for depression using the CES-D to allow similar tests of moderation in this study if the correlations between depression and developmental outcomes suggested possible moderation. As reported in Chapter 4, the association between depression and developmental outcomes were not significant. Because of this finding, tests of moderation are not included in this dissertation, which will be discussed further in Chapter 5.

Finally, a survey was developed to gather both quantitative and qualitative participant report data to indicate overall program and home visitor satisfaction and to elucidate themes related to the program objectives as detailed in the hypotheses below. Descriptive demographic data was collected to explore any patterns that emerged *a posteriori*. The demographic data relevant to the hypotheses in the next section are described and analyzed in Chapter 4. The remaining descriptive demographics can be found in Section 3.1 and/or Appendix M.

As previously stated, the general research question of this study is whether the RT paradigm could be adapted to effectively serve low-SES, predominantly Native Hawaiian communities on O‘ahu by strengthening caregiver-child relationships and improving the children’s cognitive, communicative, social-emotional, and overall developmental functioning. The research hypotheses are below.

1) The developmental trajectories of children who complete the program would significantly improve;
2) Program completion would promote responsive caregiver-child interactions;
3) High levels of depression would negatively correlate with program effectiveness;
4) Caregivers who complete the program would report stronger relationships with their child, enhanced parenting and teaching skills, inclusion of their cultural values, and overall satisfaction with the program.

The first set of hypotheses predicts the improvement of developmental trajectories for children who complete the program. Developmental trajectory was measured by the Battelle Developmental Inventory II (BDI-2) administered pre- and post-intervention. It provides an overall developmental assessment made up of five domains including Cognitive, Communication, Personal-Social, Adaptive, and Motor (see *Measures* section for more detail). While each domain has sub-domains that could prompt interesting *a posteriori* exploration in future research, the *a priori* hypotheses in the current study related to the Overall, Cognitive, Communication, and Personal-Social domain outcomes. Specifically, program completion is predicted to significantly improve children's Cognitive, Communication, Personal-Social, Overall developmental outcomes. This was evaluated using a within subjects, repeated measure MANOVA to test the hypotheses below. The post-assessment BDI-2 scores in each domain were treated as the dependent variable while controlling for the following covariates: the pre-assessment BDI-2 scores, gender, age, and whether or not the child had been a recipient of other developmental services. Ethnicity is not treated as a covariate because of the lack of variance in the sample because 95.5% of the children were of at least partial Native Hawaiian descent.

Developmental Trajectory Hypotheses:

Hypothesis 1A: Children's post-assessment scores measuring Cognitive development would improve as compared to their pre-assessment score.

Hypothesis 2B: Children's post-assessment scores measuring Communication development would improve as compared to their pre-assessment score.

Hypothesis 3C: Children's post-assessment scores measuring their Personal-Social development would significantly improve as compared to their pre-assessment score.

Hypothesis 4D: Children's post-assessment scores measuring Overall development would improve as compared to their pre-assessment score.

The second general hypothesis is that program completion would promote responsive caregiver-child interactions. Videos of the participants interacting were completed pre- and post-intervention. They were blindly coded by trained coders using the MBRS, a reliable, valid rating scale created by the developers of the RT paradigm (see *Measures* section). Appendix L describes in detail the procedures used for establishing inter-rater reliability. The decision was made to send the videos to be coded by the developers of the RT paradigm primarily because it should have theoretically increased validity because the coders were completely detached from the study. As emphasized by the MBRS developer, it is imperative raters not have a personal relationship with the participants they are rating (Mahoney et al., 1986) because they are to rate the quality of interactions as objectively as possible. Furthermore, the raters already had 50 hours of training, had their previous work published in peer-reviewed journals and were kept blind to whether the videos were pre or post with a randomized, dummy coding system.

The hypothesis below is that the post-MBRS ratings will be significantly higher than the pre-MBRS ratings when tested by a within subjects, repeated measure MANOVA. The post-

assessment MBRS scores in each domain were treated as the dependent variable while controlling for the following covariates: the pre-assessment BDI-2 scores, gender, age, and whether or not the child had been a recipient of other developmental services. Ethnicity is not treated as a covariate because of the lack of variance sample in which 95.5% of the children were of at least partial Native Hawaiian descent.

Program Completion Hypotheses:

Hypothesis 2A: There would be an increase in Caregivers' post-intervention levels on the Responsive and Child Oriented Interactive Style Factor when compared to pre-intervention levels.

Hypothesis 2B: There would be an increase in Caregivers' post-intervention levels on the Affect and Animation Interactive Style Factor when compared to pre-intervention levels.

Hypothesis 2C: There would be an increase in Caregivers' post-intervention levels on the Achievement Orientation Interactive Style Factor when compared to pre-intervention levels.

Hypothesis 2D: There would be an increase in Caregivers' post-intervention levels on the Directive Interactive Style Factor when compared to pre-invention levels.

Hypothesis 2E: There would be an increase in Caregivers' post- intervention levels on the MBRS Total score when compared to pre-invention levels.

The fundamental premise underlying the RT paradigm is to enhance the quantity and quality of responsive interactions between caregivers and children. Depression negatively correlates with such interactions and some of the past research using the RT paradigm has found

it to be a variable that moderates successful program and developmental outcomes (Mahoney, 2011; Mahoney et al., 2014). As in the existing RT research, the CES-D screening tool (see Appendix A) was administered upon entry into the program. The program is not predicted to have an effect on depression scores so there was no post-intervention screening.

Interestingly, past research using the RT paradigm has produced mixed results and differing patterns so this research will add to the existing data and help flush out correlation and patterns. For example, Mahoney and colleagues (2014) recently published an exploratory study of this phenomenon and found that high levels of depression moderated the effect of responsiveness on children's social-emotional and cognitive outcomes. However, they did not significantly affect the children's communication outcomes. The authors point to the fact they only had 19 mother-child dyads in the exploratory study and that further research is needed. Thus, the current study predicts that high levels of depression will negatively correlate with the changes in the Responsive Interactive Style Factor scale and BDI-2 measurements of developmental outcomes. This will be evaluated by testing the following hypotheses:

Hypothesis 3A: There would be a negative correlation between baseline CES-D level and pre-post change on the MBRS – Responsive Interactive Style scale.

Hypothesis 3B: There would be a negative correlation between baseline CES-D level and pre-post change on the BDI Cognitive scale.

Hypothesis 3C: There would be a negative correlation between baseline CES-D level and pre-post change on the BDI Communication scale.

Hypothesis 3D: There would be a negative correlation between baseline CES-D level and pre-post change on the BDI Personal-Social scale.

The fourth set of hypotheses are that caregivers who complete the program would report stronger relationships with their child, enhanced parenting and teaching skills, and inclusion of their cultural values. The final set of research questions is measured by a post-participation survey that was completed anonymously upon program completion (see Appendix B for survey). There are 10, 5-point Likert scale questions that quantitatively measure overall participant satisfaction when totaled. However, there are four themes within the questions that allow for more detailed analysis. Three questions rated their feedback regarding the quality of program, home visitors, and curriculum tools. Three questions measured how much they thought the program strengthened their relationship with their child and increased the quantity and quality of their responsive interactions and play. Three questions measured how much they thought the program helped them enhance their general parenting and "teaching" skills. The final question measured how well they thought the program was open to and respectful of their cultural values, needs, and desires. Beyond the quantitative scores, each question also had a section that allowed them the option to add any qualitative input towards the question. In addition, the back of the survey asked for optional input regarding "any useful information whether positive or critical." The qualitative feedback will be used descriptively in to add richness in detail to the quantitative findings as it pertains to the *a priori* themes gauged by the survey.

CHAPTER 4

RESULTS

Section 4.1: Sample Characteristics[4]

As detailed in Section 3.1, one hundred and fourteen participants showed some interest in the study. Of them, seventy engaged in the program by completing all intake assessments and at least three RT sessions. However, twenty-six of those that engaged in the program did not complete all requirements. Thus, the sample of participants who completed the entire program and are included in this analysis consisted of n = 44 of whom 25 (56.8%) were male and 19 (43.2%) female. The subjects ranged in age from 9- to 53-months-old with a mean of 26.62 months. All subjects completed 24 RT sessions. The number of weeks that were required to complete these sessions ranged from 25.29 to 95.14 with a mean of 43.12. Because we served predominantly Native Hawaiian communities, all but two (95.5%) of the children who completed were of at least partial Native Hawaiian descent. Thus, ethnicity was not treated as a covariate because of the lack of variability in the sample. Nineteen (43.2%) of those completing the program were receiving some type of early childhood services or preschool program while they participated in the current study.

Section 4.2: Descriptive Statistics[5]

The study encompassed three scales of the BDI-2 and the composite score, the four scales and overall score of the MBRS, the CES-D, and the four themes and total score of the caregiver satisfaction survey. The BDI-2 and the MBRS were administered to the subjects twice, before and after their participation in the program. The BDI-2 scores relevant to the data analysis and results are the Change Sensitive Scores that maximized sensitivity to change between

[5] Note: For succinctness, this section includes only variables relevant to the data analyzed addressing the hypotheses or discussion. All other variables and descriptive statistics are in Section 3.1 or Appendix M.

administrations of the instrument as described in Section 3.2. The descriptive statistics in Table 7 include all of the relevant scores along with the standardized *Z* Scores that will be helpful in the discussion in Chapter 5. Furthermore, Gender and Other Services were included as covariates in the data analysis as explained below and in Section 3.5. Because their group differences regarding developmental outcomes will be discussed in Chapter 5, these descriptors are listed in Table 8.

Table 7.

Descriptive Statistics for the Study's Variables

Variable	Min	Max	Med	Mean	*SD*
BDI- 2 CSS (Pre)					
Personal Social	358	527	480	480.47	28.22
Communication	344	541	457	468.69	43.17
Cognitive	407	530	469	471.36	28.52
Total	378	531	471	474.64	33.62
BDI- 2 CSS (Post)					
Personal-Social	456	551	508.5	507.57	20.22
Communication	379	556	503	505.00	32.73
Cognitive	426	566	500	501.48	26.97
Total	420	561	504.5	506.09	25.92
BDI-2 *Z* Score (Pre)					
Personal-Social	-2.53	2.53	.60	.59	1.125
Communication	-2.87	2.87	.33	.31	1.154
Cognitive	-2.53	1.33	.00	-.20	.981
Total	-2.80	2.00	.47	.39	1.091
BDI-2 *Z* Score (Post)					
Personal-Social	-.80	2.33	1.00	.98	0.811
Communication	-3.00	3.00	.67	.83	1.346
Cognitive	-2.60	2.60	.60	.51	1.211
Total	-2.40	2.73	1.30	1.08	1.163
MBRS (Pre)					
Responsive/Child Oriented	1.00	3.00	2.00	2.08	.569
Affect/Animation	1.20	3.60	2.20	2.18	.511
Achievement Orientation	1.00	3.00	2.50	2.15	.646
Directiveness	1.00	4.50	3.00	2.90	.974
Total	1.23	3.03	2.35	2.32	.405
MBRS (Post)					
Responsive/Child Oriented	1.00	4.00	2.50	2.51	.767
Affect/Animation	1.20	3.80	2.80	2.60	.564
Achievement Orientation	1.00	3.50	2.00	2.17	.671
Directiveness	1.00	4.50	3.00	2.90	.790
Total	1.05	3.28	2.61	2.54	.475
CES-D Total Score	0.00	41.00	8.00	11.71	9.58
Post Feedback Survey					
Program Effectiveness	2.67	5.00	5.00	4.78	.46
Strengthened Relationship	3.00	5.00	5.00	4.84	.43
Enhanced Parenting Skills	3.33	5.00	5.00	4.82	.42
Cultural Appropriateness	4.00	5.00	5.00	4.84	.37
Total	3.70	5.00	5.00	4.82	.34

Table 8.

Gender and Other Services Group Comparisons for BDI-2 Variables

	M (n = 25)	**F** (n = 19)	**OS*** (n = 19)	**NOS*** (n = 25)
Pre BDI-2 CSS *M*(*SD*)				
Personal Social	486.04(33.02)	473.63(19.91)	480.32(38.93)	480.96(17.87)
Communication	479.68(47.27)	454.84(34.62)	471.21(52.51)	467.24(36.56)
Cognitive	479.16(31.21)	461.68(22.33)	474.84(34.42)	469.16(24.14)
Total	483.04(36.86)	464.00(27.03)	477.00(41.77)	473.16(27.47)
Post BDI- 2 CSS *M*(*SD*)				
Personal-Social	512.08(23.45)	501.63(13.36)	510.26(24.62)	505.52(16.36)
Communication	507.56(37.73)	501.63(25.28)	509.90(41.09)	501.28(24.88)
Cognitive	506.32(31.02)	495.11(19.48)	506.21(33.91)	497.88(20.25)
Total	510.44(30.17)	500.37(18.16)	509.95(33.18)	503.16(18.89)
Pre BDI-2 *Z* Score *M*(*SD*)				
Personal-Social	.45(1.22)	.76(1.03)	.40(1.16)	.72(1.21)
Communication	.32(1.06)	.26(1.31)	.20(1.23)	.36(1.13)
Cognitive	-.27(.93)	-.13(1.08)	-.23(1.11)	-.20(.90)
Total	.29(1.10)	.47(1.11)	.23(1.24)	.47(.99)
Post BDI-2 *Z* Score *M*(*SD*)				
Personal-Social	.98(.84)	1.04(.78)	.91(.76)	1.07(.85)
Communication	.46(1.15)	1.32(1.46)	.84(1.38)	.82(1.35)
Cognitive	.31(1.03)	.80(1.42)	.54(1.29)	.50(1.20)
Total	.88(1.12)	1.35(1.19)	1.00(1.24)	1.14(1.12)

*OS = Enrolled in other services; NOS = Not enrolled in other services

Section 4.3: Hypothesis Test 1

Pursuant to the first aim of this research – to ascertain whether completion of the program significantly improved children's status in the three BDI-2 developmental domains and on their total composite score – four hypotheses were specified. In the test of each of the four hypotheses, four covariates were controlled: the pretest score on the BDI-2, gender, age, and whether or not the child had been a recipient of other developmental services.

Hypothesis 1A proposed that subjects' scores would significantly improve on the Personal-Social scale between the pre- and post-assessment. The within-subjects MANOVA to test the difference in pre-post means produced an $F(1, 43) = 147.40$ for which $p < .001$ and $\text{eta}^2 = .744$. This analysis supported the hypothesis because the post-intervention mean was

significantly higher than the pre-intervention mean. Subjects' Personal-Social developmental outcome scores improved after completing the SPIRIT program.

Hypothesis 1B proposed that subjects' scores would significantly improve on the Communication scale between the pre- and post-assessment. The difference in pre-post means produced an $F(1, 43) = 111.93$ for which $p < .001$ and $eta^2 = .722$. This analysis supported the hypothesis because the post-intervention mean was significantly higher than the pre-intervention mean. Subjects' Communication developmental outcome scores improved after completing the SPIRIT program.

Hypothesis 1C proposed that subjects' scores would significantly improve on the Cognitive scale between the pre- and post-assessment. The difference in pre-post means produced an $F(1, 43) = 238.35$ for which $p < .001$ and $eta^2 = .847$. This analysis supported the hypothesis because the post-intervention mean was significantly higher than the pre-intervention mean. Subjects' Cognitive developmental outcome scores improved after completing the SPIRIT program.

Hypothesis 1D proposed that subjects' scores would significantly improve on the Overall or total score between the pre- and post-assessment. The difference in pre-post means produced an $F(1, 43) = 252.82$ for which $p < .001$ and $eta^2 = .855$. This analysis supported the hypothesis because the post-intervention mean was significantly higher than the pre-intervention mean. Subjects' Overall developmental scores improved after completing the SPIRIT program.

Section 4.4: Hypothesis Test 2

The second aim of this research was to ascertain whether participants completed the program would evidence significant improvements in the quality of caregiver-child interactions as assessed by the MBRS (r = .66; 99% agreement within 1 point and 56% exact agreement).

Pursuant to this aim, five hypotheses were specified. Again, in the test of each of the five hypotheses four covariates were controlled: the pretest score on the dependent measure, gender, age, and whether or not the child was engaging in other developmental services.

The first of these, hypothesis 2A, proposed that subjects' scores would improve on the MBRS - Responsive and Child Oriented Interactive Style scale between the pre- and post-assessment. The difference in pre-post means produced an $F(1, 36) = 13.73$ for which $p = .001$ and $eta^2 = .276$. This analysis supported the hypothesis because the post-intervention mean was significantly higher than the pre-intervention mean. Subjects' scores on the MBRS - Responsive and Child Oriented Interactive Style scale improved after completing the SPIRIT program.

Hypothesis 2B proposed that subjects' scores would improve on the MBRS - Affect and Animation Interactive Style scale between the pre- and post-assessment. The difference in pre-post means produced an $F(1, 37) = 21.82$ for which $p = .006$ and $eta^2 = .371$. The post-intervention mean was significantly higher than the pre-intervention mean. Subjects' scores on the MBRS - Affect and Animation Interactive Style scale improved after completing the SPIRIT program.

Hypothesis 2C proposed that subjects' scores would improve on the MBRS - Achievement Orientation Interactive Style scale between the pre- and post-assessment. The difference in pre-post means produced an $F(1, 37) = .04$ for which $p = .843$ and $eta^2 = .0008$. This analysis did not support the hypothesis because the post-intervention mean was not significantly higher than the pre-intervention mean. Subjects' scores on the MBRS - Achievement Orientation Interactive Style scale did not improve after completing the SPIRIT program.

Hypothesis 2D proposed that subjects' scores would improve on the MBRS - Directive Interactive Style scale between the pre- and post-assessment. The difference in pre-post means produced an $F(1, 37) = .00$ for which $p = 1.00$ and $eta^2 = .00$. This analysis did not support the hypothesis because the post-intervention mean was not significantly higher than the pre-intervention mean. Subjects' scores on the MBRS - Directive Interactive Style scale did not improve after completing the SPIRIT program.

Hypothesis 2E proposed that subjects' scores would improve on the MBRS – Total Score between the pre- and post-assessment. The difference in pre-post means produced an $F(1, 37) = 9.15$ for which $p = .005$ and $eta^2 = .198$. This analysis supported the hypothesis because the post-intervention mean was significantly higher than the pre-intervention mean. Subjects' scores on the MBRS - Total Score improved after completing the SPIRIT program.

Section 4.5: Hypothesis Test 3

The third aim of this research was to ascertain whether degree of caregiver depression symptomology affected the degree of change in caregiver behavior and in developmental status. Operationally, this aim directed the focus of investigation on whether negative correlations exist between depression levels at baseline and change in MBRS – Responsive Interactive Style and in developmental status as measured by the Personal-Social, Cognitive, and Communication BDI-2 domain scores. In testing the four hypotheses associated with this aim, four covariates were controlled by residualizing them out of the pre-post change on the dependent variable: the pretest score on the dependent variable, gender, age, and whether or not the child had been a recipient of other developmental services.

Accordingly, hypothesis 3A proposed that there would be a negative correlation between baseline CES-D level and pre-post change on the MBRS – Responsive Interactive Style scale.

The correlation was computed to be -.075 for which p = .33 (df = 35, 1-tailed). There is no evidence of a negative relationship between baseline CES-D and changes in scores on the MBRS – Responsive Interactive Style scale.

Hypothesis 3B proposed that there would be a negative correlation between baseline CES-D level and pre-post change on the BDI-2 Personal-Social scale. This correlation was computed to be .150 for which p = .166 (df = 42, 1-tailed). There no evidence of a negative relationship between baseline CES-D and changes in scores on the BDI-2 Personal-Social scale.

Hypothesis 3C proposed that there would be a negative correlation between baseline CES-D level and pre-post change on the BDI-2 Communication scale. This correlation was computed to be -.053 for which p = .366 (df = 42, 1-tailed). There no evidence of a negative relationship between baseline CES-D and changes in scores on the BDI-2 Communication scale.

Hypothesis 3D proposed that there would not be a negative correlation between baseline CES-D level and pre-post change on the BDI-2 Cognitive scale. This correlation was computed to be .083 for which p = .297 (df = 42, 1-tailed). There is no evidence of a negative relationship between baseline CES-D and changes in scores on the BDI-2 Cognitive scale.

Section 4.6: Hypothesis Test 4

The fourth aim of this research was to ascertain whether the caregivers who complete the program would report stronger relationships with their child, enhanced parenting and teaching skills, inclusion of their cultural values, and overall program satisfaction. The post-participation included 10, 5-point Likert scale questions that quantitatively measured overall participant satisfaction when totaled. Correlations between survey theme scores and changes in the BDI-2 and MBRS were lower than random expectation assuming an alpha of .05. Therefore, the four themes within the questions are reported as means on a scale from 1 - 5. Three questions rated

their feedback regarding the quality of home visitors and curriculum tools resulting in a mean rating of 4.78. Three questions measured how much they thought the program strengthened their relationship with their child and increased the quantity and quality of their responsive interactions and play resulting in a mean rating of 4.84. Three questions measured how much they thought the program helped them enhance their general parenting and "teaching" skills resulting in a mean rating of 4.82. The final question measured how well they thought the program was open to and respectful of their cultural values, needs, and desires resulting in a mean rating of 4.84. The total composite score the entire survey was 4.82. Beyond the qualitative scores, each question also had a section that allowed them the option to add any qualitative input towards the question. In addition, the back of the survey asked for optional input regarding "any useful information whether positive or critical." As aforementioned in Section 3.2, the qualitative feedback sections were marked "optional" so there was not an extensive amount of qualitative information to explore empirically. Thus, the quantitative ratings are the primary focus of the data analysis in this section, and the qualitative feedback will be used to add richness in detail to the discussion in the next chapter. However, all of the qualitative feedback received throughout the program is listed after the survey itself in Appendix B so that the reader can reference the feedback by the themes described above.

CHAPTER 5

DISCUSSION

This dissertation addresses the general research question of whether the RT paradigm could be adapted to serve local families in need of quality ECS. This study implemented a naturalistic, before-and-after design to test whether the program could improve developmental outcomes for children by promoting responsive interactions and enhancing caregiver-child relationships. This is the first to do so in naturalistic environments in predominantly Native Hawaiian communities to include such diverse ability levels in the study's sample. The results are promising but constrained by the limitations of the program and study design.

Overall, there is strong evidence that the children who completed the program showed significant improvement in developmental outcomes across all domains. There are mixed results regarding the improvement of the caregiver-child interaction variables measured by the MBRS video coding process. However, caregiver survey feedback reported by those completing the program indicates extremely high satisfaction across all themes. With that said, the constraints of the research design make it difficult to establish a causal relationship between the program procedures and developmental outcomes. The discussion of these details adds to both the existing RT related research and the general literature regarding the general adaptation and implementation of ECS programs, especially within naturalistic contexts.

Section 5.1: Developmental Outcomes

There is strong evidence to support the primary objective of Project SPIRIT. The children who completed the program showed significant improvements in the developmental outcomes according to all measures and all domains relevant to the study. The participant data set was initially tested using a paired sample t-test to compare each child's post-program developmental

outcome scores to their own pre-program scores, a common method for within subjects designs with no control group. The results showed statistically significant improvements across the Personal-Social, Cognitive, Communication, and Overall domains at $p = .05$. Although promising, I became concerned that the affects of covariates were not accounted for using this method, especially effects related to the children participating in other ECS or preschool programs. To address this concern, I wrote syntax to construct a MANOVA in SPSS controlling for the covariates by residualizing them out of the pre-post change in the dependent variable. Controlling for age and gender was a straightforward process and did not change the significant levels of any of the domains. Before-and-after studies often use the pre-test measures as an additional covariate to control for differences on pre-test that may affect the degree of improvement test scores, especially when the measure has a definable floor and ceiling, as does the BDI-2. Adding this covariate to age and gender did not reduce any of the developmental outcomes below significance. Most importantly, I knew I would be limited in implying causal outcomes connected directly to the program without a control group so I accounted for children engaging in other ECS or preschool programs. Because of such strong developmental outcomes, all of the domains remained significant when controlling for the effects of all four of these covariates at the same time.

Existing research implementing the RT paradigm found that the effects of caregiver depression symptomology as measured by the CES-D screening tool affected development outcomes. The current study found no evidence of a negative correlation between baseline CES-D levels in pre-post change on any of the three developmental domains measured by the BDI-2. However, this finding may speak more to the descriptive of this particular sample more than to the effects of depression symptomology on developmental outcomes when applying the RT

paradigm. The mean of the sample's CES-D scores (see Table 7 in Section 4.2 for details) was 11.71 or 4.29 points below the cutoff score of 16 is used to identify those at-risk for clinical depression. As can be seen in Figure 5, only 10 participants were above the CES-D cutoff score and only five were dramatically higher. Therefore, these data suggest that depression did not affect developmental outcomes likely related to the low level of depression symptomology of participants.

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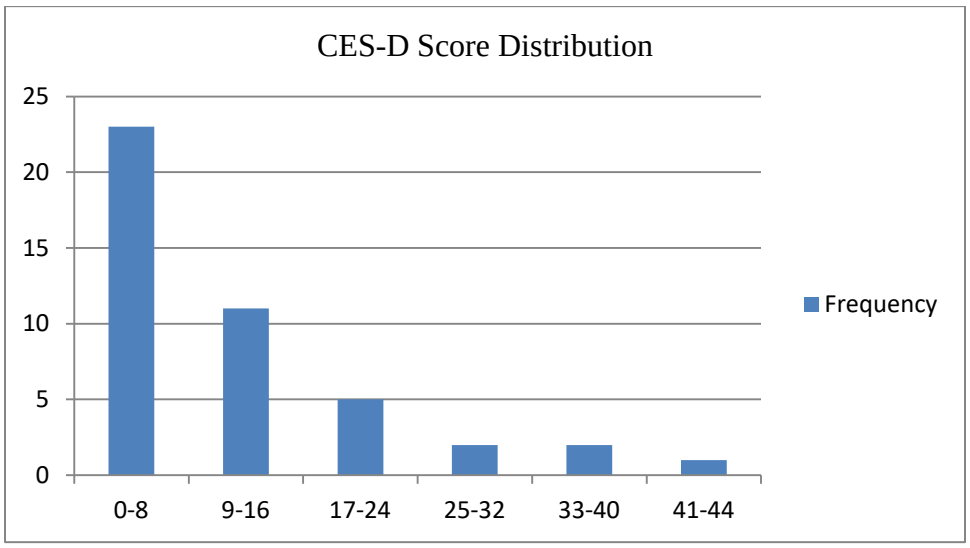

Figure 5. Participant Distribution of CESD Scores.

The subgroup of participants of most interest in the current study was the group of children engaged in other services (n = 19; 43.2%) because of the confounding effects other programs may have on the developmental outcomes. The subgroup predictably started the program with overall lower *Z* scores (.23 versus .47 *SD*s) and lower minimum extremes (-2.8 versus -1.8 *SD*s). This is most likely why they had other services while engaging in our program because they showed more pronounced developmental needs. Interestingly this subgroup also showed slightly higher improvement on their overall developmental outcomes according to the

amount of change in their CSS (+32.9 versus +30). This may not seem like much of a difference, but when one considers that they are the group with the most pronounced delay, it is telling. It could be hypothesized that those with milder delays or higher ability levels would improve more, but that was not the case in the current study. I believe this speaks to the fact that ECS are important to help those lagging behind catch up with peers and multiple services may improve developmental outcomes more than a single service. While it is impossible to separate the effects of SPIRIT and other programs in which the children were participating, it is a bidirectional, dynamic relationship. That is, SPIRIT may have helped the children participate more effectively in or benefit from other programs as evidenced in the following quote reported in the post-program feedback (see Appendix B for all of the qualitative feedback received):

> The SPIRIT project has help us in so many ways that we can think of [sic]. When we first started bringing [child's name] to Keiki Steps, I just felt like I didn't know what I was doing, everyone look at me [sic], and I felt like I was being judge for not being able to control my son's behavior and temper [sic]. Becoming a new mother, no one gives you a manual, and every child is different. I lost hope in bringing [child's name] out because I felt ashamed. But [sic] SPIRIT has opened up understanding and worked with me from the start. I felt like they weren't judging me but understanding my struggles and work with me [sic]. I have confidence in [child's name] and the more time we spend with each other and worked with SPIRIT project, it connected us and strengthened our relationship as a family [sic].

Although participants engaging in other services did improve slightly more, it is important to know that all domain scores remained significant when accounting for this effect as a covariate.

Furthermore, many of the children in the mild, moderate, or at-risk categories were not eligible to receive other services.

As previously stated, the State of Hawai‘i Part C Early Intervention Program redefined eligibility criteria using standardized Z scores from 1 *SD* from the norm to 1.5 *SD*s from the mean. In the theoretical distribution of the population according to the normal distribution of test scores, 15.9% of the population falls below 1 *SD* with 13.6% of them falling between 1 and 2 *SD*s. Using this theoretical distribution, 9.2% of the population eligible to receive special needs services no longer qualified when the criteria moved from 1 to 1.5 *SD*s. Thus, it was important to us to not only help those with more significant developmental delays but also those with mild to moderate ones and those environmentally at-risk. This wide range of ability levels is represented by the standardized *Z* scores in the descriptive data in the results section of this dissertation. The pre-program overall, accumulative mean of the sample in the current study was +.39 but with a wide distribution that ranged from -2.402 to +2.73 with a *SD* of 1.163. The current study is the first to use the RT paradigm to serve a sample with such a diverse range of ability levels.

Impressively, the post-program accumulative *Z* scores rose from +.39 to +1.08, a gain of +.69. This is no small change considering that a shift of .5 *SD* for a child could alter a diagnosis from "moderately delay" to "no delay." The communication domain showed a +.52 increase relative to peers, from +.31 to +.83. One mother described her child’s gains on the feedback survey by saying the program provided “a lot of floor time activities to promote communication: and that she “notice[d] him more open, expressive, and talking more.” Interestingly, it was the Cognitive domain that showed the most dramatic gains relative to peers of +.71 *SD*, from -.20 to +.51 (i.e., below the mean to half a *SD* above the mean). This is interesting because we did not emphasize teaching discrete skills but focused on enhancing pivotal behaviors through

responsive interactions and play as explained in Chapter 2. Although our program did not employ didactic teaching methods, some caregivers still provided post-program feedback thanking us "for supporting [their] learning goals and preparing [their] child for school." One caregiver expounded upon this notion by the program had been "a great help to [her] son" and that she could "see the great progress he makes every day" reporting cognitive advances such as him learning "his colors and animals" and "how to count to ten." This feedback, along with the overall cognitive gains, provides evidence that the play-based, relationship-oriented RT paradigm may be able to promote academic skills via responsive, developmentally appropriate interactions.

Another fascinating finding is that the Personal-Social domain showed the smallest gains relative to norms with a +.39 increase. However, this domain also started at a higher level than all the others at +.59 and ended at a higher level at +.98 than all the other domains except the overall, accumulative score. Thus, it seems our sample began with relatively strong personal-social skills relative to the normative sample as compared with the other domains. Peer Interaction is one of the three measurements that comprise the BDI-2 Personal-Social composite score and something outside of the realm of the usual RT paradigm that focuses on parent-child dyads. The idea, based on developmental theory, is that young children are most heavily engaged in social interactions with caregivers and their primary Microsystems. While true, our sample was more of a traditionally collective one than in the existing research and included large families with shared living spaces that emphasized group cohesiveness. Perhaps our sample had more experience adhering to collective social scripts and interacting with adults and children more collectively as described in the following post-program feedback (see Appendix B for all of the qualitative feedback received):

> During this past year with Project SPIRIT, my child and I have gained strategies and activities that are age appropriate for interaction with each other. Through this program, I have learn how to socialize with my child and how I can help him become a positive individual. The main goal for my child was learning to share and take turns with his cousins and friends. With the help of my parent educator she provided activities that help meet my goals [sic].

Finally, it also seems that the two domains, Adaptive and Motor, that were outside the scope of the current study also showed strong gains relative to peers because the +.69 overall, composite score increase was higher than the average of the three domains included in the study, and the post-program BDI-2 composite score was the highest outcome at +1.08. This will be discussed more in the future directions section of this chapter. Figure 6[6] provides a visual representation of the increases in developmental outcomes across all relative domains along a normative distribution.

[6] All of the data displayed graphically in this figure and discussed in this section can be found in the Results Section 4.1.

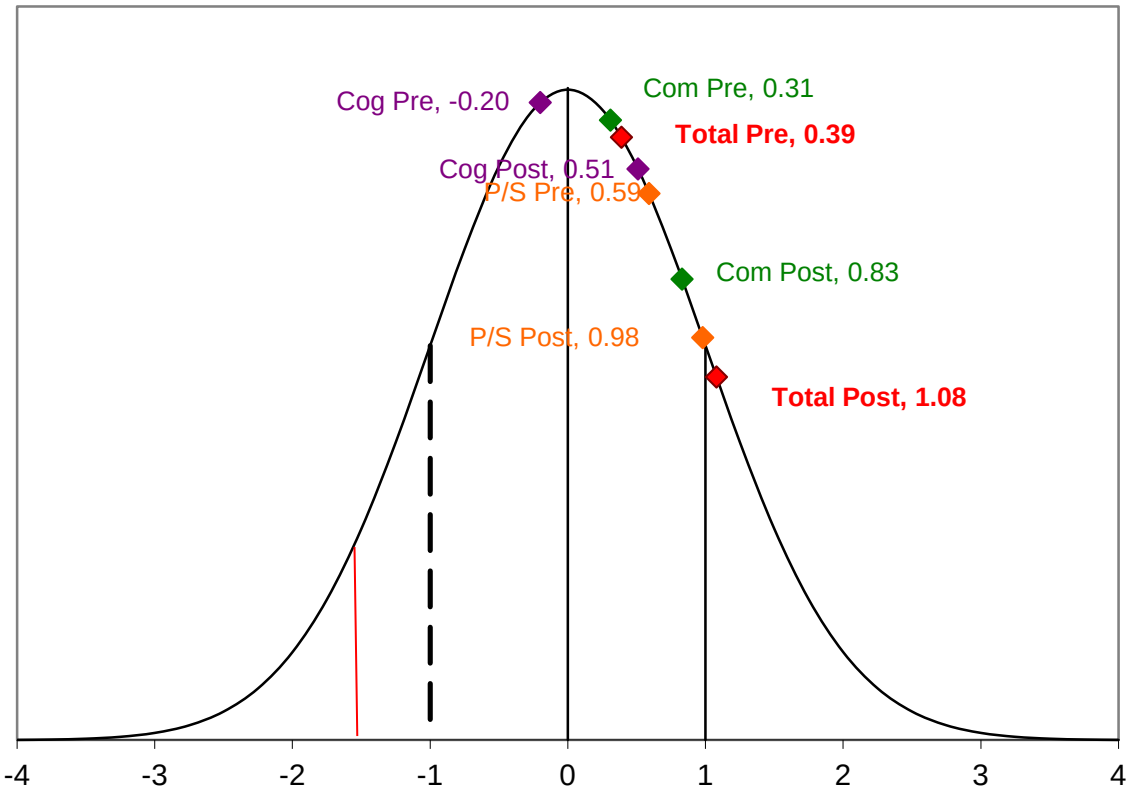

Figure 6. Distribution of BDI-2 Pre-Post *Z* Scores on a Normal Curve.

While the Z score outcomes are impressive, they show whether our sample made gains relative to peers, but they are not an accurate reflection of how much growth actually occurred within the group when compared to themselves. This problem came to national attention in 2003 when the US DOE's Office of Special Education Programs funded a grant to measure the outcomes of children participating in ECS. Programs were required to report children's developmental status and the amount of change between the pre- and post-measures before-and-after program participation (LaForte, 2014). The creators of the BDI-2 responded by developing a Rasch-based measurement called the Change Sensitive Score (CSS) that would be more reflective of actual changes in a child's ability level. The measurement used the same

transformation of the Rasch logit metric as the W or metric in the Woodcock-Johnson III and IV to develop a linear transformation on an equal interval scale so that score differences are equitable across domains and sub-domains. LaForte (2014) reported that "[t]his type of Rasch-based metric is ideally suited for use in identifying delay, tracking progress, and the aggregate reporting required of state agencies serving young children with developmental delays. Unlike most norm-referenced methods of identification, the CSSs are not influenced by the shape of the score district from a particular normative sample; rather, they maintain their meaning across the entire range of ability" (p. 20). It was for these reasons the CSSs were chosen as the primary indicators of changes in developmental trajectories for program participants. Table 9[7] summarizes the pre-, post-program CSSs for each domain and Difference Scores that illustrates developmental growth in that particular domain.

Table 9.

Pre-Post CSS and Difference Scores

	Pre-CSS	**Post-CSS**	**Difference**
Personal-Social	480.47	507.57	+ 27.1
Communication	468.69	505.00	+ 36.31
Cognitive	471.36	501.48	+ 30.12
Overall Accumulative	474.64	506.09	+ 31.45

The exact interpretation of these scores and changes as they pertain to the level of development and growth expectations are still being developed because the original BDI was normed using raw and Z scores. However, LaForte (2014) offers an interesting theoretical person

[7] All of the data displayed in this table and discussed in this section was collated from the Descriptive Statistics table in Results Section 4.2. Difference scores were calculated by subtracting the pre-scores from the post-scores.

using the W score of the Woodcock-Johnson III and IV upon which the CSSs are based. Both scoring metrics eliminate negative numbers with a mean of 500 and the scaling factor of 9.1024. As can be seen in Table 9, every domain in the current study not only increased statistically significantly, but they also increased from below the CSS mean to above it. LaForte (2014) used the Woodcock-Johnson W score metric[8] to develop "corresponding interpretations for examinee level of development for various CSS Difference Scores on the BDI-2" (p. 17). These Difference Scores and corresponding examinee's level of development are compared to the Difference Scores in the current study in Table 10.

Table 10.

Pre-Post CSS and Difference Scores As Related to Level of Development

CSS Difference Score	Examinee's Level of Development	Project SPIRIT CSS Results
+31 and above	Very Advanced	
+14 to +30	Advanced	
+7 to +13	Age-Appropriate to Advanced	**Personal-Social (Post)**
−6 to +6	Age-Appropriate	**Communication (Post)** **Cognitive (Post)** **Overall (Post)**
−13 to −7	Mildly Delayed to Age-Appropriate	
−30 to −14	Mildly Delayed	**Personal-Social (Pre)** **Cognitive (Pre)** **Overall (Pre)**
−50 to −31	Moderately Delayed	**Communication (Pre)**
−51 and below	Severely Delayed	

[8] "In its derivation and application, the CSS is nearly identical to the W-score metric first introduced by Woodcock and Dahl (1971) and used extensively in the Woodcock-Johnson tests for more than 35 years. Many of the interpretive features of the BDI-2, including the CSS, "difference scores," Relative Developmental Index (RDI), and RDI-associated levels of development, borrow heavily from Woodcock (1978), McGrew, Werder, and Woodcock (1991), and McGrew, Schrank, and Woodcock (2007)" (LaForte, 2014, p. 16).

Although theoretical at this point, these data in Table 10 show aggregate differences that progress from Mildly or Moderately delayed to Age-Appropriate to Age-Appropriate Advanced. When combined with the outcomes of the MANOVA accounting for covariates and the changes in the *Z* scores, these data indicate that children who completed the SPIRIT program improved their Personal-Social, Communication, Cognitive, and Overall developmental outcomes significantly. These outcomes are also supported by the findings in the caregiver feedback survey related to the theme of "Program Effectiveness" (i.e. process, curriculum, and home visitor) rated a 4.78 out of 5 overall, as well as the overall satisfaction for the total survey being 4.82. This quantitative feedback is described by the following qualitative feedback reported anonymously on the post-program survey. The feedback also reminds us that although the results of developmental outcomes are aggregated as a collection of numbers, this growth is of the utmost importance to the family on the individual level as it reflects the progress of their child.

> I will forever be grateful for Project SPIRIT. I think I learn better from hands-on experiences and this gave me the opportunity to teach my children to grow with each other. My first child had trust issues, social set backs, and behavioral markers for possible future disorders. After completing the program, she has made 1+ points [i.e., *SD*s] of above average social and cognitive growth, she is strong and independent, she is social and playful and has loving, trusting relationships with family members and friends [sic].

These outcomes are impressive and meaningful for the individuals participating; however, it is not possible to say that these outcomes are causally driven by participation in the program without a control group. Although this will remain true, the exploration of the results in the next section provides supporting evidence.

Section 5.2: Responsive Interaction and Relationship Outcomes

While improved developmental outcomes were the ultimate goal of the current study, these gains are theorized to be driven by the programs ability to promote quality, responsive caregiver-child interactions. These interactions have been shown to not only improve developmental outcomes, but to also help caregivers build stronger relationships with their child while enhancing parenting and teaching skills. These factors were measured by the MBRS outcomes and the themes within the caregiver feedback survey, including qualitative feedback reported anonymously. One caregiver reported that, "SPIRIT [was] a very big help to our family and has helped us greatly to grow as a family. In truth, I have seen such great results out of myself and my relationship with our son, that I am truly grateful."

The MBRS rating scale was the primary method for measuring the improvement of the caregiver-child interaction factors. The purpose of the scale is to measure 12 points related to the RTC objectives that describe four Interactive Style Factors describing caregiver-child interaction qualities (Responsive and Child Oriented, Affect and Animation, Achievement Orientation, and Directiveness; see Appendix I for further description). This scale can be used for program evaluation because the post- intervention videos should show a significant improvement in the scale items representative of program objectives. It can also help in the interpretation of developmental outcome measurements because research has shown the caregiver-child interactive variables are associated with the child's developmental growth (Mahoney 1998; Mahoney, et al., 1986). The current study was designed to meet those in need where they were in their natural environments and to provide services to those in need as early as possible. To do so, experimental control and the use of a control group was sacrificed. Therefore, the MBRS results

do provide interesting data and supporting evidence; however, they cannot be used to causally link developmental outcomes to the program process.

The MBRS results indicate post-program improvements in some of the Interactive Style Factor indexes but not in others. There was an issue related to the coding of the MBRS videos that needs to be reiterated here. The videos were sent to blind, reliable, published coders to strengthen validity (see *Measures* section for more detail). Although the coders had already been trained and shown reliable in past research utilizing the MBRS, there were difficulties doing so on the SPIRIT videos. The MBRS developer suggests a Pearson correlation to be .75 or higher to establish inter-rater reliability with 100% agreement within 1 point and 80% exact agreement (see Appendix L). The SPIRIT correlations were r = .66; 99% agreement within 1 point and 56% exact agreement. However, it is important to note that almost all of the ratings were within one point of one another, and the raters have a vital group process for coming to an agreement on disagreements on ratings. Thus, coders outside of the program, blind to whether videos were pre- or post-videos coded videos presented in random order, Then, they worked together to come to an agreement on the ones that were just one point away from one another. Although the Pearson correlation to establish inter-rater reliability is .09 less what it should be, I do not believe this renders the measurements invalid. Actually, I believe the issues related to the cultural and environmental differences the current study compared to the previous studies and thus add important findings to the existing literature. The reasons stated by the coders for the mostly one-point discrepancies were: 1) more than one adult in the video, 2) several children involved in the observation, 3) the lack of developmentally appropriate toys and activities in the environment. These reasons are very telling because every one of them relate to differences in applying the RT paradigm in our specific naturalistic contexts. Furthermore, the family structures and living

environments in these predominant Native Hawaiian communities include more shared living arrangements and more shared caregiving responsibilities than the samples in the previous research. This was a vital cultural and family systems variable to consider as elucidated by the following report in the post-program feedback survey:

> This program has help me to understand and how to care for my grandchild. Being a grandfather at age 75, I did not have the opportunity to help raise and teach my four daughters because I had to work and the responsibility was put on my wife [sic]. Now that my wife has pass-on, and my daughter and son-in-law works. The responsibility is put on myself, and I am the baby-sitter from 5:00 AM to 5:00 PM Monday to Friday. I now know how important education is to my granddaughter and for her to develop the different skills at this very young age. I am grateful and thankful to be introduced into this program and to thank my home visitors … very much [sic].

Chapter 2 describes many of these cultural differences in detail as part of the cultural ubiquity theme of Section 2.3 that was used to guide the RT adaptation in the current study. It also describes other cultural differences that I believed to be related to the differences in which particular Interactive Style Factors showed significant improvement in which of them did not. The first two Interactive Style Factors below relate to general interaction and relationship outcomes, and they showed significant post-program improvement. However, the final two Interactive Style Factors relate to more specific parenting and teaching skills, and they did not show significant post-program improvement. This is important because SPIRIT continuously emphasized cultural ubiquity in all phases of the project as evidenced by a 4.84 out of 5 on the caregiver feedback question asking how well the "program/team were open & respectful to [their] cultural values, practices, & desires." In doing so, staff was trained to understand that they

were not there to tell the caregivers how to parent or work on discrete teaching skills per se, as outlined in Section 2.4. I believe this training regarding the manners in which to individualize the program to each family and cultural context is reflected in the MBRS findings as discussed below.

The Responsive and Child Oriented index was the primary factor concerning the current study as delineated *a priori.* This index measures the caregiver's responsivity and reciprocity within caregiver-child interactions and their sensitivity to their child's interests and cues. This is the fundamental premise underlining the RT paradigm and the primary one emphasized Project SPIRIT. Home visitors were encouraged to individualize the curriculum to follow the desires and needs of the participants; however, every program began with objectives and activities related to understanding the need for and improving responsive interactions. I trained them to understand that these interactions were the vehicles within which all other objectives and activities would be placed. Teaching the caregivers to be sensitive to their child's interests and engage in responsive, serve-and-return interactions is primary driver of developmental and relationship outcomes according to the literature reviewed in this dissertation. Furthermore, Section 2.4 explores literature that suggests responsivity may be less affected by cultural differences than other caregiving variables, especially in following the family's lead and individualizing the program. I believe all these effects to be evidenced by the fact that the Responsive and Child Oriented Interactive Style Factor showed the most significant post-program improvement. Some caregivers even reported the increase of responsiveness directly saying the program was "successful at teaching [them] responsive teaching strategies" and that they "will be more responsive with [their] kids" in the post-program survey.

Some of the existing research implementing the RT paradigm found the effects of caregiver depression symptomology as measured by the CES-D screening tool affected development outcomes by reducing the caregivers' quantity and quality of responsive interactions measured by this index. The current study found no evidence of a negative correlation between baseline CES-D level in pre-post change on the Responsive and Child Oriented Interactive Style Factor index. As discussed in the previous section, this finding may speak more to the descriptive of this particular sample more than to the effects of depression symptomology on developmental outcomes when applying the RT paradigm. The mean of the sample's CES-D scores (see Table 7 in Section 4.2 for details) was 11.71or 4.29 points below the cutoff score of 16 used to identify those at-risk for clinical depression. Therefore, these data suggest that depression did not affect Responsive and Child Oriented interaction outcomes likely because of the low level of depression symptomology of the participant sample.

The other Interactive Style Factor related to relationship improvement and the enhancement of quality caregiver-child interactions improved significantly. The Affect and Animation index is comprised of the following categories: Acceptance, Enjoyment, Expressiveness, Inventiveness, and Warmth. This index was reflected in the program's other main goal of prompting the caregivers to think developmentally when interacting with their child and with warm affect and enjoyment when playing with their child. We routinely instructed the caregiver to think of play as how they both connect and "teach" their children and to think from the child's perspective. This was outlined in Section 2.4 within the discussion of relationship and play-based best practices as opposed to didactic teaching of discrete skills. When combined with the Responsive and Child Oriented factors, these indexes reflect the best practices outlined in Section 2.4 of enhancing quality relationships through

developmentally appropriate, responsive interactions. I believe this to be the one of the primary reasons these two factors showed significant improvements. The findings support this notion when combined with the results of the themes of the caregiver feedback survey. The themes gauging the strengthening of relationship and enhanced parenting skills were rated 4.84 and 4.82 out of 5. These feedback ratings measured whether caregivers felt they "strengthen[ed] [their] relationship overall," spent "more time playing/interacting," enhanced "the quality of time" spent with their child, helped their "child grow and learn," and "increased [their] overall knowledge, skills, and ability to support [their] child's development."

This quantitative feedback is described by the following qualitative feedback reported anonymously on the post-program survey:

> I'm so glad our family had the opportunity to participate in SPIRIT. Before joining this program, I was a full-time working mother with various shifts and no set schedules. I never had the time, nor took the time to play with my son. I never thought playing with your child was so critical. SPIRIT was a real eye opener. If it wasn't for SPIRIT and the help of [Home Visitor], I would not have developed a trusting relationship with [my child]. Plus, I learned a healthier way to discipline my children. I hope this program stays around to help other families who are willing to put the work into their children. After this, I can say my husband and I are fully invested in our children. Thank you for having us [sic].

The final Interaction Style Factors did not show significant improvement upon program completion. There is an interesting distinction between these two indexes and the previous two. The Achievement Orientation index is comprised of two scales - Achievement and Verbal Praise. The Achievement scale is described as "the parent's encouragement of sensory motor

and cognitive achievement." The Verbal Praise scale "assesses how much verbal praise is given to the child." The final Directive index "measures the frequency and intensity in which the parent requests, commands, hints or attempts in other manners to direct the child's immediate behavior." As explained in the paragraph above, the current study emphasized the responsivity and quality interaction objectives and activities reflected in the first two Interactive Style Factors as the fundamental components of the program. This could be a reason that these two indexes were not found to significantly improve. While I believe this to be partly true, I think some of the cultural differences explored in Chapter 2 might have affected these results as well.

Pedagogical models of parenting are of the independent pathway (Greenfield et al., 2003), and they include their own normative behavioral scripts, cultural values, required tasks, and personnel (e.g., adults as teachers). The traditional collectivist prototype may not include preparation congruent with the learning expectations and norms held by the video raters from the mainland US who are experienced rating more traditional, Western populations. The current study's sample was comprised of families in predominant Native communities and almost all of the children were of at least partial Hawaiian descent. Thus, the families' educational and parenting ethnotheories may vary in style and content from the traditional Western, independent approaches. This is especially true considering the context of these three Interactive Style Factor sub-scales because of what they are measuring when viewed from the cultural lens outlined in this dissertation. As discussed, fundamental cultural values and practices manifest early in parenting models. Parenting expectations and interaction patterns often diverge along generalized independent and interdependent pathways (LeVine, 1994). This is what I believe to be at least partially affecting the outcomes in the final Interactive Style Factors because most of

the existing evidence was derived from more traditionally independent, mainland US culture that differs from the more traditionally collectivist one served by our program. For example, Western pedagogical models of child rearing emphasize academic engagement and social exchange by promoting verbal reciprocity and use of protoconversations with young children (LeVine, 1994). However, many non-Western cultures and families in low-SES environments emphasize physical protection and soothing (LeVine, 1994). These differences manifest in everyday interactions when Western parents respond to infant babbling by eliciting excitement with questions and praise. However, parents in some other cultures tend to respond more to distress with opposite reactions such as modulating excitement and with more directive commands (LeVine, 1994). All of the examples above are driven by cultural and environmental variables. Table 11 outlines other empirically derived sources of conflict between microsystems characteristic of interdependent and independent cultural pathways (Trumbull et al., 2001).

Table 11.

Sources of Home School Conflict

Individualism	Collectivism
Child as an individual	Child as part of the group
Independence	Helpfulness
Praise (for positive self-esteem)	Criticize (for normative behavior)
Cognitive skills	Social skills
Oral expression	Listening to authority
Parents' role is to teach	Teachers' role is to educate
Personal property	Sharing

NOTE: Adapted from Trumbull et al., 2001.

An examination of these examples in the Table 11, provides evidence of why the Achievement, Verbal Praise, and Directive scales may have not significantly "improved" or whether a significant change would have indeed been improvement. The Achievement scale is

reflective of the pedagogical models of parenting representative of the independent pathway (Greenfield et al., 2003). As Trumbull et al. (2001) found, collectivist pathways such as those traditionally associated with Hawaiian ethnotheries do not emphasize the same roles and scripts. Collectivist caregivers often do not feel their role is to be a "teacher" driving the cognitive development of their child. In addition, they tend to emphasize social skills and for the child to be a cohesive part of the group. The Verbal Praise and Directive scales reflect similar cultural differences of which we were clearly aware during both the design and implementation of Project SPIRIT. For example, we often dealt with caregivers, especially fathers, engaging their children in manners RT paradigm would most likely label as overly directive and/critical. As evident in Table 11, this could be related to a cultural difference as more collectivist cultures like those in our sample tend to emphasize adherence to group norms and listening to authority over individualization and oral expression. They also tend to criticize (for normative behavior) more than their Western counterparts who tend to praise (for positive self-esteem). SES could have also played a role, as low-SES caregivers tend to follow the same trend (Hart and Risley, 1995). Collectivist cultures also tend to have more of an apprenticeship type teaching style more than a pedagogical one which would emphasize less praise and oral interaction and more physical modeling without expecting the child to ask many questions. This was a delicate balance for our program because a fundamental principle of the RT paradigm is to teach caregivers to interact responsively with their child in reciprocal interactions by reading their cues and following their lead when applicable (Mahoney & MacDonald, 2007). However, it was equally important that we considered the caregivers' parenting and cultural beliefs as well.

I believe the cultural differences in the current study's sample and process affected the outcomes of the Achievement, Verbal Praise, Directive scales in two ways. First, I am positive

that these were not primary objectives in our program because we were sensitive to these cultural differences and because we emphasized warm engagements, responsive interactions, and play. Second, these cultural differences may have affected the coders' ability to rate what are indeed culturally appropriate roles and scripts because of their own enculturated norms and expectations. This could also be a factor contributing to the lower than expected inter-rater reliability along with the naturalistic contexts that included more players and distractions and less "developmentally appropriate" toys as will be discussed more in the following section.

Section 5.3: Conclusion, Limitations, and Future Directions

The general research question of this study is whether the RT paradigm could be adapted to effectively serve low-SES, predominantly Native Hawaiian communities on O'ahu by strengthening caregiver-child relationships and improving the children's developmental functioning. The findings indicate that participants completing the program showed significant improvements in their Personal-Social, Cognitive, Communication, and Overall developmental outcomes when compared to their own pre-program developmental scores and developmental norms. The primary objective of Project SPIRIT was to provide accessible, naturalistic early childhood services for local families in need to improve developmental outcomes. Because the naturalistic validity and accessibility was emphasized, "experimental control" was decreased. Therefore, it is not possible to establish a direct, causal link between the development outcomes and program completion, especially because of the lack of an experimental control group. However, the pattern of findings suggests the program had positive outcomes.

It is important to note that the primary outcome assessment tool was a developmental assessment that measures ability levels according to chronological age and developmental norms. Thus, a young child is unlikely to make leaps in ability levels in such a short timeframe with no

assistance. In preschool age children, this assistance is primarily provided by their primary caregivers. Helping caregivers strengthen relationships, engage in responsive interactions and play, and improve their child's developmental trajectory was the fundamental premise of the program. However, the current study cannot definitively point to program participation as the sole reason for the improved developmental outcomes without a control group. However, we accounted for the participants that were engaging in other services in our pre-and post-measures. While those participants showed slightly more pronounced developmental gains than those solely participating in Project SPIRIT did, the results remained statistically significant even when accounting for the covariate effects of other programs.

The coding of pre-and post-program videoed interactions produced mixed results. Participants completing the program showed significant improvements in Responsive and Child Oriented interaction behaviors, which is consistent with the existing literature and RT research that provides evidence that these behaviors are what drive developmental improvements. The caregiver feedback strongly supported this finding. However, the lack of experimental control in the current study prevents the researchers determining whether parental responsiveness was a causal influence on developmental outcomes related to the intervention. The videoed interaction data also showed that caregivers engaged in more reciprocal, diverse play-based interactions showing more acceptance, enjoyment, and warmth upon program completion. The caregiver feedback data also strongly supports that this enhanced relationships, prompted more quality interactions and play, and made caregivers feel their general parenting skills improved. On the caregiver feedback survey, one caregiver described it as such:

> Before the spirit program I had a hard time with my step children ages 4 and 5. We really didn't communicate very well and we didn't have a good relationship. As well as with my

> daughter. After the program, we now make it mandatory to have one on one quality time with all three kids. The print outs of varies activities came in handy in our individual play session every week. We learned how to better communicate with the kids and how to better manage stress and the kids, with different techniques. We learned that one on one quality time with each child affect them in positive ways as well as their behaviors. Very very useful. [sic]

Although the results are promising when considered all together, the experimental control limitations in the current study prevent the researchers determining whether the outcomes were directly because of participation in the program. Interestingly, the videoed interaction data did not support post-program improvements in interaction behaviors related to actively promoting cognitive achievement, decreasing directiveness, or increasing verbal praise. However, this may be because of the cultural and naturalistic environment differences between the current study and the previous research implementing the RT paradigm adding important breadth to the existing literature.

The existing research has also produced limited findings regarding whether depression symptomology affects program outcomes by decreasing both the quality and quantity of caregiver-child interactions. This was not the case in the current study; however, these findings are limited for two reasons. First, the study design allowed depression levels to be controlled for as a covariate but not accounted for as a mediating factor. Second, the cohort participating in the current study showed average levels of depression symptomology below the screening tool's cutoff level indicating that depression was not a major issue in the group as a whole. Overall, the findings are promising but restricted by the limitations below.

Even with these limitations, this original, applied research adds important data and program implementation/adaptation findings to the existing research. It is the first to adapt the RT paradigm to serve predominantly Native Hawaiian communities on O‘ahu within their naturalistic environments. It is also the first to implement the program procedures to serve a cohort with such diverse ability levels. In doing so, the implementation framework, program design, procedure adaptations, and study limitations add to both the existing RT research findings and to the general early childhood service literature.

Limitations and Future Directions. While care was taken with data collection procedures and program design, there are some concerns. Most of them relate to the realities of applying research methodologies in the naturalistic and cultural contexts of the current study that include too many variables within the environmental and family system to account for them all. As discussed in the literature review, it was imperative to adopt a systems perspective for helping these young children and their families. While I believe this strengthened clinical procedures, it weakened “experimental control.” First, there is no control group. However, I feel strongly that the before-and-after design was most appropriate for this research, balancing both ethical and research-based concerns.

I am also confident the developmental assessment tool chosen produced comprehensive, valid data. However, there are limitations concerning the video data and the rating process used to code it. The MBRS (see Appendix I) tool itself has been evidenced as valid and reliable in several publications as previously detailed. However, it has been used with mostly middle-class, Caucasian mother-child dyads. Section 2.4 explored the existing research to show that RT has been adapted for studies in Korea and Turkey and maintained its efficacy (Karaslan et al., 2011 and 2012; Kim & Mahoney, 2004 and 2005). However, those dyads mimicked the Western

paradigms in that they included middle-class mothers often travelling to center-based facilities or program therapists brought developmentally appropriate toys to the participant's home. Thus, mother-child dyads were recorded in a more controlled setting full of developmentally appropriate toys and with no other children, family, and/or other distractions that were common to our particular environments. As stated, it was important for us to serve our participants in the most naturalistic contexts possible which I believe boosted the validity of our clinical practices. However, these were often public or shared living environments that included many distractions and obstacles in which the existing research did not entail.

We employed coders at Case Western University in Ohio because they were well-trained and proven reliable (see Appendix L for the reliability process). They were also blind to our program context, procedures, and which videos were pre versus post. However, their coders' feedback described concerns about videos and environments. First, they reported that many of the videos included multiple people beyond just a caregiver-child dyad. Their past research included one caregiver (almost always the mother) and one child in a controlled environment that excluded other people and included toys matched to the developmental age of the child. As explained, naturalistic validity was emphasized because the caregivers were asked to perform the strategies in their everyday routines, interactions, and settings. Practically, this meant that other caregivers and children were in the environment and the videos at times. This is also a cultural difference related to our more traditionally collective sample who often has shared living environments and caregiving responsibilities. We attempted to minimize this as best we could, but it was a reality of our natural environments. Furthermore, we were recording "how they would usually interact or play with their child" so we did not introduce specified toys to elicit interactions if they were not already in the environment. Although we would bring toys and

activities from time to time, we did not want to introduce anything they could not do when we left because of a lack of resources. We were asking them to perform the activities and strategies inside their everyday settings and routines so it was important that caregivers had the resources and tools to do so once we left. We also adapted or conceptualized many activities and tasks using culturally or environmentally relevant tools and procedures. Differences in interaction styles related to cultural or SES factors might have affected the coders' ratings. Future research should adapt the MBRS to be more reflective of the cultural and family system variables that exist within their particular sample. It should also train coders with experience within the particular culture while keeping them blind to program predictions and randomizing the videos so coders do not know whether they are rating a pre- or post-measure.

Finally, Project SPIRIT participants averaged just over 10-months in the program completing 24 interactive sessions and implementing a daily action plan. When planning such ECS programs, future researchers should consider the difficulty in recruiting and retaining participants as discussed in Section 3.1. Furthermore, the sample size of 44 participants completing the program is a fair one for this type of research, but does restrict the implications of the findings. With this size of a sample from predominantly Native Hawaiian communities on O'ahu whose children were 95.5% of at least partial Native Hawaiian descent, one must be cautious in generalizing the findings or even the approaches to other populations or for making any sweeping generalizations.

There are a few notable points for the direction of future studies using the current ones existing data or if one were to replicate this study. Regarding the difficulty with recruitment and retention previously mentioned, future studies should perhaps emphasize the time investment more in the beginning and include a qualitative exit interview for those that decide to quit to help

tweak recruitment procedures. A similar qualitative exit interview could be conducted for those completing the program to collect a higher quantity and quality of qualitative data. Although we gave participants this option in the post-program feedback survey, we did not receive enough qualitative data to perform a content analysis that could have added substantial data to support program effectiveness and outcomes.

For the data that does exist in the current study, future analyses could explore differences in the sub-domains of the BDI-2. Although outside the scope of this study, there may exist interesting differences in Expressive versus Receptive Communication scores that may relate to the cultural variables of our sample. Similarly, the outcomes of the Overall BDI-2 composite score indicated there might have been positive changes in the Adaptive and Motor domains as well. These could also be explored in the future.

The primary limitation of this study was the lack of an experimental control group needed to derive more causal findings linking program completion to development of outcomes. I would not recommend a waitlist control if no other services were available for the reasons outlined in Chapter 2. If one had access to another early childhood service program, participants could be randomly assigned to one of the programs and the results compared to one another. While this is experimentally sound, it is often costly and difficult to do, especially when trying to serve those most in need and fill gaps in existing services available. A general preschool or SPED classroom could be and has been used as a control group in past RT research (see Section 2.4 and 2.5). This would cut costs associated with developing a new program and avoid the unethical procedure of providing young children with needs a placebo treatment during critical periods of development. However, a general preschool environment may lack a sufficient number of children with developmental delays or specific diagnoses. Contrarily, children who are at-risk, with mild

delays, or are undiagnosed may be overlooked when choosing a SPED classroom as the control group. The type of applied, accessible, naturalistic research conducted in this study is important but difficult to design, implement, and control. However, this should not stop us from providing those with diverse needs – whether mild, moderate, severe, undiagnosed, or environmentally at-risk – the critical early childhood services they need to reach their own full potential.

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Appendix A

Center for Epidemiologic Studies Depression Scale

Name of Child: _____ Name of Caregiver: _____ Date: _____
Client Number:_____ Relationship to Child: _____

Center for Epidemiologic Studies Depression Scale (CES-D)

Date: _____

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you've felt this way during the **past week**. Respond to all items.

Place a check mark (✓) in the appropriate column. **During the past week...**	**Rarely or none of the time (less than 1 day)**	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of time (3-4 days)**	**All of the time (5-7 days)**
1. I was bothered by things that usually don't bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues even with help from my family.				
4. I felt that I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt that everything I did was an effort.				
8. I felt hopeful about the future.				
9. I thought my life had been a failure.				
10. I felt fearful.				
11. My sleep was restless.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				
16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people disliked me.				
20. I could not "get going."				

Source: Radloff, L.S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*: 385-401.

Appendix B

Caregiver Satisfaction Survey

You Are the:
O Mother
O Father
O _____

Child Details:
O Girl
O Boy
Age (months)

Based on the statement made in the first box, please circle whether you 1-Strongly DISagree; 2-DISagree; 3-Neutral (neither agree nor disagree); 4-Agree; 5-Strongly Agree. You may choose to just circle the numbers, but this survey is to help us serve our participants better so you can also choose to write any comments or suggestions in the space below each statement. Mahalo nui loa for you participation and help improving our services.

Home Visitor's Name:_____ Your Name: (OPTIONAL) _____

	Ratings (Pease circle your response)				
Do you agree with the statement below? *Note: Comments are welcome but optional*	**Strongly DISagree**	**DISagree**	**Neutral (Don't Agree or Disagree**	**Agree**	**Strongly Agree**
1. My home visitor has listened to my concerns, supported me, and effectively helped me achieve my goals for my child. *Comments:*	1	2	3	4	5
2. My home visitor explained the responsive teaching strategies clearly, provided effective examples, and answered or found answers to any questions I had. *Comments:*_____	1	2	3	4	5
3. This program has helped strengthen my relationship with my child overall. *Comments:*_____	1	2	3	4	5
4. I spend more time playing/interacting with my child after participating in SPIRIT. *Comments:*_____	1	2	3	4	5
5. I feel the overall quality of the time I spend with my child has gotten better with the help of SPIRIT. *Comments:*_____	1	2	3	4	5
6. I feel SPIRIT has assisted me in helping my child grow, learn, and prepare for future learning environments. *Comments:*		2	3	4	5

7. SPIRIT has increased my overall knowledge, skills, and ability to support my child's development. *Comments:*_____	1	2	3	4	5
8. SPIRIT has increased my knowledge, skills, and ability to prevent or respond to challenging behaviors. *Comments:*_____	1	2	3	4	5
9. The paperwork given was easy to understand & useful to me (ex. family action plan, session plan, rating scales) *Comments:*	1	2	3	4	5
10. The SPIRIT program/ team were open & respectful to my cultural values, practices, & desires. *Comments:*_____	1	2	3	4	5

Please tell us ANY useful information or feedback whether positive or critical. Any testimonials we can anonymously share with our federal funders & the Native Hawaiian Educational Council are much appreciated & can

Would you refer your family or friends to participate in SPIRIT? _____ YES

Referrals: **NAME**	**CONTACT INFO**	**Relationship** **Can we mention your referral?**
1)		
2)		

Relationship to Child 1	Caregiver Satisfaction Survey Comments
Grandfather	Q2: Very helpful Q3: Very much Q6: Very helpful Q7: Very true Q8: Very much Q10: Very true Comment section: This program has help me to understand and how to care for my grandchild. Being a grandfather at age 75, I did not have the opportunity to help raise and teach my four daughters because I had to work and the responsibility was put on my wife. Now that my wife has pass-on, and my daughter and son-in-law works. The responsibility is put on myself and I am the baby-sitter from 5:00 AM to 5:00 PM Monday to Friday. I know how important education is to my granddaughter and for her to develop the different skills at this very young age. I am grateful and thankful to be introduced into this program and to thank my home visitors Ulu Kahikina and Dewayne Bettag very much.
Mother	Final Comments: Taking the time to be part of SPIRIT alone was a help. It taught me that if I can get 5 min of 1 on 1 play time with my child I should take it. Mahalo nui loa. Under referals she wrote: unfortunately no one young enough!
Mother	Question 1: "Sonny has helped and supported us more than expected." Question 2: "She always gave perfect understanding for all my questions and concerns." Question 3: :Yes, I noticed that my relationship with my kids has increased." Question 7: "It gave me a lot of knowledge." Question 9: "It helped me a lot and is great use for the future." Question 10: "They always showed the 'aloha' spirit." General Comments: The SPIRIT Program has taught not only my kids different things, but it has also taught me useful information as a mother. I'm glad that I was given the opportunity to be a part of a wonderful program. I hope that the next family is blessed with the knowledge and experience that was given to me. Maholo Spirit Program!

Mother

Question 1: "Her heart and care really 'shined' for both me and my kids."
Question 2: "She always gave me an open understanding for all my concerns."
Question 4: "It made me realize how important parent & child relationship is."
Question 7: "This is one increase of knowledge that I gained."
Question 9: "It was very helpful for present and future use."
Question 10: "They showed the 'aloha' spirit."

General Comments:
The SPIRIT program has taught me so many things as a mother to grow and teach my kids different things in many different ways. They helped me understand how critical and precious it is to have a relationship with your child. The SPIRIT Program has been very supportive and helpful for me and my children during the last months, while we were enrolled. It saddens me that our time in the program has come to an end, but it also makes me happy that another family will be able to gain the knowledge and experience that my family and I had. Aloha and Ahui hou.

Mother

This survey was sent in months after the child completed the program.

Parent checked "yes" would be willing to refer, but did not list anyone to refer.

Question 1: "She always listened and was open and flexible"
Question 2: "Helped with redirection."
Question 3: "understand my child's temperament"
Question 4: "a lot of floor time"
Question 5: "activities to promote"
Question 6: "I loved the activity"

General comments:
"During this past year with project spirit my child and I have gained strategies and activities that are age appropriate for interaction with my each other. Through this program I have learn how to socialize with my child and how I can help him become a positive individual. The main goal for my child was learning to share and take turns with his cousins and friends. With the help of my parent educator she provided activities that help meet my goals."

Father

No question level comments. No specific references for SPIRIT.

General level comments: "I believe the program would excel if a couple is in line to being better. Child gets its actions and thoughts from what is normal to

	their eyes at home. Problems is easy to fulfill if the head of home is in harmony. Kids naturally be good or bad by environment. How they speak, manners, learning, parents gives a child a self image. A self improvement is being a person than as a couple."
	Question 1: "It is harder because we have marriage issue and it affect everything in our child."
Mother	Question 2: "On some and no on some subjects- again it starts from a marriage which affects child."
	Question 9: "Too much fine reading and lose paper."
	General comments: "Have skilled workers to deal with many marriage issue first as it link to parent and child relationship, it also affects the whole environment of the family gathering with the sessions."
Mother	Question 2: "Always came with helpful suggestions to try." Question 5: "Child moods varies." Question 7: "Some care givers are stuck in old ways." Question 8: "I as a parent struggle." Question 10: "Always respectful."
	General Comments: I will forever be grateful for Project SPIRIT. I think I learn better from hands-on experiences and this gave me the opportunity to teach my children to grow with each other. My first child had trust issues, social set backs, and behavioral markers for possible future disorders. After completing the program she has made 1+ points of above average social and cognitive growth, she is strong and independent, she is social and playful and has loving, trusting relationships with family members and friends. My second child is always striving to achieve personal growth and success.
Father	No answer to would you recommend question. No comments on individual questions.

	Final/general comments: "LOVE IT!!!...I would recommend anybody to go through Project SPIRIT
Mother	No answer to would you recommend question. No comments on individual questions. Final/general comments: "We learned a lot from our Project SPIRIT worker. She taught us a lot and helped us grow as parents. She listened to all our concerns and helped us.
Grandmother	This client checked "yes" for the referral question, but did not list any people to refer. Comment on question #4: "doing homework, reading, playing baseball." Comment on question #5: "more open and talking, expressive" General Comment: "I notice [my child is] more expressive, talking more. He plays and share better."
Mother	Final Comments: "I'm so glad our family had the opportunity to participate in SPIRIT. Before joining this program I was a full-time working mother with various shifts and no set schedules. I never had the time, nor took the time to play with my son. I never thought playing with your child was so critical. SPIRIT was a real eye opener. If it wasn't for SPIRIT and the help of Cynthia, I would not have developed a trusting relationship with [my child]. Plus I learned a healthier way to discipline my children. I hope this program stays around to help other families who are willing to put the work into their children. After this I can say my husband and I are fully invested in our children. Thank you for having us.
	No response to would you refer question Final Comments: Project SPIRIT has been a very big help to our family, and has helped us greatly to grow as a family. In truth, I have seen such great results out of myself and my

Father	relationship with our son, that I am truly grateful for being given the chance to participate in this program.
Mother	No comments
Father	No comments on individual level questions. Father did list 3 people who might be interested in SPIRIT Final Comments: "The Project SPIRIT is an invaluable tool helping families. I am very grateful for all the assistance Cynthia Lau provided us. She is very professional in many aspects of parenting. I have learned a lot from her in dealing with my children. She is very caring, respectful, kind, knowledgeable about her job. Mahalo for helping me getting a head start on my children. Her professionalism made a big difference in dealing with my children."
Grandmother	No item-level comments General Comments: "Thank you for support our learning goals for my child in preparing my child for school and making it possible for us to stay indoors and in our own home, with our educator. Every visit was most memorable and I so want to say thank you again"
Mother	Mother did refer 3 families for SPIRIT Question 1 comments: "Don has been very with helping us understand his behavior." General Comments: "This Spirit project has help us in so many ways that we can think of. When we first started brining [child] to Keiki Steps I just felt like I didn't know what I was doing, everyone look at me, and I felt like I was being judge for not being able to control my son's behavior and temper. Becoming a new mother, no one gives you a manual, and every child is different. I lost hope in brining [child] out because I felt ashame. But Spirit has opened up understanding, and worked with me from the start. I felt like they weren't judging me, but understanding my struggles and work with me. I have confidence in [child] and the more time with spend with each other and worked with Spirit project, it connected us and strengthen our relationship as a family. [child] has been so good with this program and Don and Sonny has been so

helpful. Thank you guy so much."

Father — Father did list 2 contacts to refer to SPIRIT.

No question level comments

General comments: "First of all, I would like to acknowledge the professionalism of Dan and Cynthia for their understanding, caring and patience with my children. Thank you very much for all your help, especially Cynthia coming to our house every week, helping us on every aspects of discipline, playing with my children. She is a good mom in her own right, a great motivator, disciplinarian, friendly and honest. Cynthia is perfect for this kind of work. She have all the qualities and knowledge to be productive helping other families like us. She have earned my respect for her "can do" attitude and professionalism. She is an asset to your organization and to any organizations she wants to work with. Again, mahalo for all the help."

Mother — No answer on the referral question

Comments:
Question 1: "with effective techniques"
Question 3: "My stepson's and I now have an awesome relationship."
Question 4: "We now do individual play session, the kids love it, twice a week."
Question 5: "From 0 times a week we now make it mandatory to at least do it twice a week."
Question 10: "very understanding"

General comments: "Before the spirit program I had a hard time with my step children ages 4 and 5. We really didn't communicate very well and we didn't have a good relationship. As well as with my daughter. After the program we now make it mandatory to have one on one quality time with all three kids. The print outs of varies activities came in handy in our individual play session every week. We learned how to better communicate with the kids and how to better manage stress and the kids, with different techniques. We learned that one on one quality time with each child affect them in positive ways as well as their behaviors. Very very useful."

Mother — Checked "yes" to referring other families, but did not list any specific referrals.

Question 3 comment: "We now do activities or at least something with each

	child daily"
Mother	No extra comments on the question section. Did not list specific people for recommendations. General comments: "Ulu was very kind and accommodating to our family, often scheduling appts on weekends to accommodate our work schedules. She was professional and always willing to help. The way in which she interacted with our son [name] made us feel so comfortable. We enjoyed our time with Ulu and our only wish is that we had a bit more direction on how to better manage difficult or unwanted behaviors such as biting or tantrums. Overall we were very happy with Project Spirit and Ulu and felt it was a valuable experience for our family!
Mother	No question level comments. Parent did list 2 people to refer for SPIRIT. General Comments: "I really had such an awesome experience with this program and I am sad to see it be discontinued after this year. [The coach] has been such a great help towards my son and I can see the progress he makes each and every day. Every time I mention that we are going to see Aunty he becomes so excited and can't wait to see her. Now my son knows how to count 1-10 and he knows some of his colors. I really wish this program would continue so I could offer this to my future children. I love [coach], she has such a great spirit and I can just open up to her and tell her how everything is going. It's really sad to see our journey end. I will miss her and all the things she did. Mahalo nui."
Father	No question level comments and no answer to whether parent would refer friends. General Comments: "[Coach] was not only successful at teaching me responsive teaching strategies, but because Aunty to my girls, and they became very fond of her. It was apparent that [coach] took this more than a job but something that she really enjoy doing, working with children and developing their skills is a passion. I am glad that she was our home visitor, I would recommend her and the SPIRIT program to others that I come into contact with in the future."
Mother	Mother skipped question 4, and did not comment on any of the questions.

	Mother also did not respond to the question asking if she would refer others to SPIRIT Final comment: "I really enjoyed the SPIRIT Club coming out to teach me and my family how to help with my son's development issues. He is so kind and helpful, helping with with understanding cognitive information. The only thing I thought bad was the program is too long and a little much. Maybe every two week instead of every week might be easier for families. Mahalo Nui Loa."
Great-aunt (current caregiver)	Caregiver gave a name to refer us to. Comment on Question #4: "Try to practice what we've learned throughout the week." Question #6: "Big time, she very good at using what she learned" General Comments: "Project SPIRIT need more people like Ulu and Dawn, Ulu has been a blessing and a helpful resources to my family and the growth of [name] girl. I would absolutely refer friends of friends to project SPIRIT and have Ulu as their home visitor. Project SPIRIT has been a learning experience for [my child] as well as us, "my family."
Father	Father did give name to refer to. Q1: "She was the best teacher for me and my daughter" Q2: "She also give me most then I needed to teach my daughter" Q3: "Also give me the tools I needed for my daughter" Q4: "The homework had our bond more stronger" Q5: "Every time" Q6: "A lot and more" Q7: "After everyone" Q8: "a hole lot and more" Q9: "really helpful" Q10: "even more" General Comments: "I think that this program should stay and that it should be brought to every family even to the one that does be ask for. You guys should go house to house and invite them to this program. I have even brought the tool to my family and share the tools to them so that their kids can also learn the things

	my daughter had."
Mother	Referral question not answered. Final Comments: "I really enjoyed participating in this program. I wish it was longer than the 24 sessions. But with the amount of time given we did get to cover a lot of subjects to help with my daughter. I wish more people would know about this. It really helps.
Father	Referral question not answered. Final Comments: "With such a great program and great home visitors, there needs to be more than just 24 sessions. The curriculum and what we learn from our experience with home visitor, really works and really helps to build a good relationship with our children. I am thankful and grateful that I was able to participate in all the sessions."
Mother	No comments were made at the item of general level. Mother also did not answer the question of whether she would refer clients to SPIRIT.
Mother	This parent wrote no extra comments, but did list one name as a referral for SPIRIT
Grandmother	Question 1: "I do more activities and spend more time with them" Question 2: "It helped with me and my babies" Question 3: "Yes, especially with my grandson/daughter" Question 4: "Yes, I do a lot." Question 5: "Yes, we share more with each other, daily." Question 6: "[sibling of client] will be a blessing for himself and others." Question 8: "I will be able to be more responsive for these kids and me." Question 9: "Thank you for all the paperwork, I can go back to it." Question 10: "They'll be happy and prepared for a great journey in life." Final Comments: "I want to thank you for all the help, teaching and preparcy [sic] with the kids for our (they're) future, and plans to look for a new school year 2013-2014.

Grandmother listed several referrals for project spirit.

Mother

****Aunty also filled out a survey, but was only involved in a few sessions. Her survey is in client file, but not recorded here in database.

Mother's final comments:
"Thank you so much for coming around Cynthia and trying to help and bring our family together! You've tried your best to understand and what we've been going through with or without you around you've bared of wit of it with your wisdom and knowledge and feedback :) Mahalo and Aloha." (smiley face part of comment)

Mom also wrote down several referrals for Project Spirit.

Appendix C

IRB Approvals

Office of Research Compliance
Human Studies Program

UNIVERSITY of HAWAI'I MĀNOA

MEMORANDUM
CR

October 22, 2013

TO: Jean Johnson, Associate Director
Dewayne Bettag, MS
Principal Investigators
Center on Disability Studies

FROM: Denise A. Lin-DeShetler, MPH, MA
Director

SUBJECT: CHS #19487- "PROJECT SPIRIT: Supporting Parents in Responsive Interactions"

Under an expedited review procedure, the research project identified above was approved for one year on October 18, 2013 by the University of Hawaii (UH) Human Studies Program. The application qualified for expedited review under CFR 46.110 and 21 CFR 56.110, Category (7).

This memorandum is your record of the Human Studies Program approval of this study. Please maintain it with your study records.

The Human Studies Program approval for this project will expire on October 17, 2014. If you expect your project to continue beyond this date, you must submit an application for renewal of this Human Studies Program approval. The Human Studies Program approval must be maintained for the entire term of your project.

If, during the course of your project, you intend to make changes to this study, you must obtain approval from the Human Studies Program prior to implementing any changes. If an Unanticipated Problem occurs during the course of the study, you must notify the Human Studies Program within 24 hours of knowledge of the problem. A formal report must be submitted to the Human Studies Program within 10 days. The definition of "Unanticipated Problem" may be found at: http://hawaii.edu/irb/download/documents/SOPP_101_UP_Reporting.pdf, and the report form may be downloaded here: http://hawaii.edu/irb/download/forms/App_UP_Report.doc.

You are required to maintain complete records pertaining to the use of humans as participants in your research. This includes all information or materials conveyed to and received from participants as well as signed consent forms, data, analyses, and results. These records must be maintained for at least three years following project completion or termination, and they are subject to inspection and review by the Human Studies Program and other authorized agencies.

1960 East-West Road
Biomedical Sciences Building B104
Honolulu, Hawai'i 96822
Telephone: (808) 956-5007
Fax: (808) 956-8683

UNIVERSITY OF HAWAI'I

Committee on Human Studies

MEMORANDUM

September 30, 2011

TO: Jean Johnson, Associate Director
Principal Investigator
Center on Disability Studies

FROM: Nancy R. King
Director

SUBJECT: CHS #19487- "Project SPIRIT: Supporting Parents in Responsive Interactions"

Under an expedited review procedure, the research project identified above was approved for one year on September 27, 2011 by the University of Hawaii (UH) Committee on Human Studies (CHS). The application qualified for expedited review under CFR 46.110 and 21 CFR 56.110, Category (7).

This memorandum is your record of CHS approval of this study. Please maintain it with your study records.

CHS approval for this project will expire on September 26, 2012. If you expect your project to continue beyond this date, you must submit an application for renewal of this CHS approval. CHS approval must be maintained for the entire term of your project.

If, during the course of your project, you intend to make changes to this study, you must obtain CHS approval prior to implementing them. Unanticipated problems that are likely to affect study participants must be promptly reported to the CHS.

You are required to maintain complete records pertaining to the use of humans as participants in your research. This includes all information or materials conveyed to and received from participants as well as signed consent forms, data, analyses, and results. These records must be maintained for at least three years following project completion or termination, and they are subject to inspection and review by CHS and other authorized agencies.

Please notify this office when your project is complete. Upon notification, we will close our files pertaining to your project. Reactivation of CHS approval will require a new CHS application.

Please contact this office if you have any questions or require assistance. We appreciate your cooperation, and wish you success with your research.

1960 East-West Road, Biomedical D104, Honolulu, Hawaii 96822-2303
Telephone: (808) 956-5007, Facsimile: (808) 956-8085, Website: www.hawaii.edu/chs

Appendix D

Consents for Participation, Video Recording, and Sharing Information

Parent Informed Consent for Participation

Dear Parent and Guardian,

Your child and family have been chosen to participate in an exciting program called PROJECT SPIRIT: Supporting Parents in Responsive Interventions. The proposed intervention uses the Responsive Teaching Curriculum, an evidence-based child development curriculum that is focused on strengthening parent child relationships. The purpose of this informed consent is to explain the program and inform you on what you will be asked to do should you decide to participate. **Participation in this project is entirely voluntary and you are free to withdraw at any time without penalty of any kind**. No changes in your child's educational status or school services will occur because of your decision not to participate. There is no fee to participate in Project SPIRIT.

Project SPIRIT is in its first year of implementation. By the end of the three year grant, we hope to work with approximately 350 children and their families on the island of Oahu. Alu Like, Inc., a local non-profit organization with a focus on Native Hawaiian values and community empowerment will partner with our team at the University of Hawaii, Center on Disability Studies to support families work with the Responsive Teaching Curriculum.

Project SPIRIT Goals:
1) Improve at-risk Native Hawaiian children's education readiness and early development,
2) Provide evidence-based skills and support for Native Hawaiian parents of children ages 1-4 years using the Responsive Teaching Curriculum and,
3) Provide professional development for Native Hawaiian interventionists.

Proposed Project Outcomes. Each participating child will 1) develop and enhance positive interactions with their parent; 2) reduce difficult child behavior; 3) increase frequency of pivotal behaviors; and 4) improve their social, emotional, communication, and cognitive development.

Responsive Teaching Curriculum- RTC. The Responsive Teaching Curriculum was developed to help adults ***maximize the potential of each of their routine interactions*** with their children so that caregivers support and enhance children's development and well-being in their day-to-day interactions (Mahoney, Perales, Wiggers & Herman, 2006). Project SPIRIT addresses both the need for effective and evidence-based preventive early intervention programs as well as the benefit of a positive home-school transition. Families who have consented to participate in the study will receive 24 home visits by an interventionist who will provide the child's primary caregiver in the home with the Responsive Teaching Curriculum intervention. Sessions last from 45 minutes to one hour and 15 minutes in the parent(s) home. Typically, the sessions are provided weekly to give parents the time they need to try to use and explore

the information presented in each session. Each session focuses on one or two behaviors that are relevant to the needs of the child. For each behavior, the interventionist introduces one or two sets of Discussion Points to provide parents with background information on the behaviors they are being asked to encourage their child to use.

The Responsive Teaching Curriculum is designed to promote the three domains of developmental functioning in children: (1) ***cognition***—children's ability to think, reason, solve problems and learn new information about their world and relationships; (2) ***communication***—children's ability to convey their feelings, observations, and intentions and respond to the feelings, observations and intentions of others through nonverbal, symbolic, and spoken language; and (3) ***socio-emotional functioning***—children's ability to engage in and enjoy developmentally appropriate interactions with parents, adults, and other children as well as to comply with reasonable rules and expectations (Mahoney, Perales, Wiggers & Herman, 2006).

Components of Project SPIRIT and Activities we are asking consent for: Responsive Teaching 1) Curriculum - RTC. Sessions run once a week for 24 weeks and last approximately 1 hour per session. You will be asked to participate fully in these sessions in order for maximum benefit of the program and complete activities with your child.

2) Assessment. We would like to collect information on you and your child throughout your participation. We will be collecting data on SPIRIT participants at four different time points (before the program, during the program, after the program, and 3 months after the program is finished) to measure progress. Measurements include: (1) Battelle Developmental Inventory, 2nd Edition (BDI-2); (2) Maternal Behavior Rating Scale; (3) Center for Epidemiologic Studies **Depression** Scale (**CES-D**), A Parent Satisfaction Survey will be given after the program is finished.

3)Photographs and Video. At times SPIRIT staff will take photographs and video footage of students, parents, teachers and classroom staff engaged in program activities. These images will be stored and monitored by the Principal Investigator and Project Coordinator and may be used for the purposes of evaluating, training, advertising, communicating information related to the program and/or editorial purposes. Photo and video consent for this project is completely voluntary and can be withdrawn by you at any time without penalty.

Risks and what will be done to reduce the risks: You may feel uncomfortable about discussing your experiences or answering questions about your child, or otherwise feel self-conscious while participating. To make you more comfortable, you do not need to answer any questions that make you uncomfortable. All information is confidential and you can withdraw participation at any time. However, if you still feel uncomfortable, you are encouraged to discuss your concerns with project staff.

Any information you give us will not be recorded with your name on it, but will be identified by a number code. In reports of our program, results are presented in terms of groups of people, so no one can tell what individuals actually participated in the project.
We will not give information to anyone unless:
A) You provide a signed release; or

B) We have reason to suspect elder abuse or child abuse, neglect, or endangerment. Reports of suspected abuse, neglect, or endangerment are required by law. Reports will be made to the Department of Human Services Child Welfare or Senior and Disabled Services, as appropriate; or
C) We have reason to suspect that anyone is in imminent danger of seriously hurting themselves or someone else. Such reports will be made to the appropriate authorities. However, if you still feel uncomfortable, you are encouraged to discuss your concerns with project staff. You are free to stop participating in this project at any time without penalty.

Possible benefits involved in participation: There may not be any direct benefit for participating in this project. However, as a result of taking part in our study, you could learn more about parenting, improve your relationship with your child, and promote school success skills. This may eventually lead to improved health and mental well-being. For other parents of children, the information from this program could provide evidence for the intervention's future use. It may also help schools provide effective and appropriate services in the future. There is an ultimate benefit to society in creating an adoptable, effective early intervention model.

Contact Information: This program is managed by staff from the University of Hawai`i at Mānoa College of Education's Center on Disability Studies in Honolulu, Hawaii. This project is funded by a three year grant from the U.S. Department of Education's Native Hawaiian Program (Award #S362A110009). If you would like more information in order to make your decision, or simply want to discuss any questions or concerns you might have, please contact Principal Investigator Dr. Jean Johnson at the contact information listed below. If you have questions about your rights as a research subject, call the University of Hawai`i's Committee on Human Subjects, (808) 956-5007.

Please keep this letter and a copy of this signed consent for your files. Indicate your consent or non-consent to participate on the attached form and return it to University of Hawaii College of Education's Center on Disability Studies as soon as possible. Thank you for your time and cooperation.

Sincerely,

Jean Johnson, Ph.D.	Dewayne Bettag, MS
Principal Investigator	Co-Principal Investigator
(808) 956-2653	(808) 956-4453
jeanj@hawaii.edu	dbettag@hawaii.edu

PROJECT SPIRIT: ***Supporting Parents in Responsive Interactions***

Parent Informed Consent for Participation: *Parent copy*

(Check one of the following) I have read and understand the attached description of PROJECT SPIRIT: Supporting Parents in Responsive Interventions and:

☐ **YES, I GIVE CONSENT** for my child to participate in all aspects of Project SPIRIT and I agree to participate in Project SPIRIT parental activities. I understand that if my child and or other family members participating in this project are injured in the course of this research procedure, I alone may be responsible for the costs of treating my and or their injuries.

OR

☐ **NO, I DO NOT GIVE CONSENT** for my child to participate and I do not agree to participate in Project SPIRIT parental activities. (If you decline participation, please sign and date below but do not fill out additional contact information.)

Parent or Guardian's Signature_____ Date (MMandDDandYY):

Parent or Guardian's Name (First, MI, Last): _____

Relationship to Child- Check one: ☐ Mother ☐ Father ☐ Other (Explain)_____

Cell Phone: _____ Home Phone: _____ Work Phone:_____

Email: _____

Address_____ City_____, HI Zip_____

Child's Name (First, MI, Last):_____

PHOTO and VIDEO RELEASE: I grant permission to *PROJECT SPIRIT: Supporting Parents in Responsive Interactions* the right to use, alter without restriction, reproduce, and publish photographs and videos of me or my child engaged in Project SPIRIT activities for evaluating, training, advertising, communicating information related to the program and/or editorial purposes in any medium. I release the University of Hawai`i at Mānoa and the College of Education's Center on Disability Studies and its employees from any claims, actions and liability relating to its use of said photographs and videos.

Check one of the following:

- ☐ **Yes**, I grant permission for the photo and video release.
- ☐ **No**, I do not grant permission for the photo and video release.

Parent Signature: _____Date(MMandDDandYY):_____

Consent for Release of Information

AUTHORIZATION TO RELEASE CONFIDENTIAL INFORMATION

I. Authorization for University of Hawaii, CDS, Project SPIRIT Program to release information to another agency or entity:

I and we, authorize University of Hawaii Project SPIRIT Program and its employees to release confidential information regarding

_____

(Print Name of Participant)

to _____

(Agency or Person)

_____

(Print Agency Address)

II. Authorization for other agency or person to release information to University of Hawaii, CDS, Project SPIRIT Program.

I and we authorize _____ and its employees to release confidential

(Agency or Person)

information regarding participant named above to Project Spirit.

I understand that University of Hawaii, CDS, Project SPIRIT Program needs this authorization to make the disclosure requested above. I understand that signing this authorization form is voluntary but may be necessary for me to be referred to other programs outside of University of Hawaii, CDS, Project SPIRIT Program. I understand that if I refuse to sign this authorization, University of Hawaii, CDS, Project SPIRIT Program will not disclose the information requested.

I understand that, if University of Hawaii, CDS, Project SPIRIT Program is releasing the above information to someone who is not legally required to keep it confidential, it may be re-disclosed and may no longer be kept confidential.

I understand that I may cancel this authorization at any time by notifying University of Hawaii, CDS, Project SPIRIT Program in writing. I understand that the cancellation will not apply to any information that was already released. If not cancelled earlier, the authorization will end one (1) year from the date of my signature or 90 days from the date of authorization for a one-time release of information. I will be given a copy of this signed form.

Participant or Personal Representative Signature:
Effective Date: _____

Print Name: _____Relationship to Participant *(if not signed by Participant)*: _____

University of Hawaii, CDS, Project SPIRIT Program staff - Witnessed by: _____
_____Date: _____

Appendix E

Demographic Collection Form

PROJECT SPIRIT: Supporting Parents in Responsive InTeractions

Parent/ Child Demographic Form

Basic Information

1. Today's date (MM/DD/YY) ____/____/____ **2.**Child's Date of birth (MM/DD/YY) ____/____/____

3. Child's legal name: First, MI, Last _____

4. Child's Gender: ☐ Female ☐ Male

5. Your legal name: First, MI, Last _____

6. Your relationship to child: ☐ Mother ☐ Father ☐ Other _____

7. Cell Phone: _____ **8.** Home Phone: _____ **9.** Work Phone:_____

10. Email: _____

11. Home Address_____**12.** City_____ HI **13.**Zip_____

Race

14. Check all that apply:	Child	Mother	Father
Native Hawaiian	☐	☐	☐
Other Pacific Islander	☐	☐	☐
African American	☐	☐	☐
American Indian/ Alaska Native	☐	☐	☐
Asian	☐	☐	☐
Hispanic	☐	☐	☐
Portuguese	☐	☐	☐
White	☐	☐	☐
Other	☐	☐	☐

Family Information

15. Family composition:

☐ Two- parent household
☐ Single parent household
☐ Child lives with another primary caregiver
☐ Other _____

16. Employment status of caregivers:

Employed full time	☐	☐	☐
Employed part time	☐	☐	☐
Not employed	☐	☐	☐
Other	☐	☐	☐

17. Educational level of caregivers:	Mother	Father	Other Primary Caregiver _____
Less than high school diploma	☐	☐	☐
High school diploma	☐	☐	☐
Some college, no degree	☐	☐	☐
Associates degree	☐	☐	☐
Bachelors degree	☐	☐	☐
Masters degree	☐	☐	☐
Doctorate degree	☐	☐	☐

18. Ages of caregivers:	Mother	Father	Other Primary Caregiver _____
Under 18 years old	☐	☐	☐
18-29 years old	☐	☐	☐
30-39 years old	☐	☐	☐
40-49 years old	☐	☐	☐
50-59 years old	☐	☐	☐
60-69 years old	☐	☐	☐
70-79 years old	☐	☐	☐
80-89 years old	☐	☐	☐
Over 89 years old	☐	☐	☐

19. Combined household income (check one):

☐ Less than $9,999 per year
☐ $10,000- $19,999 per year
☐ $20,000- $29,999 per year
☐ $30,000- $39,999 per year
☐ $40,000- $49,999 per year
☐ $50,000- $59,000 per year
☐ $60,000- $69,999 per year
☐ More than $70,000 per year

20. Is your child that is participating in this project receiving any other services or education to help them learn, grow, or prepare for school?

☐ NO
☐ YES Services Received:

Appendix F

Data Collection Tools and Procedures

1) The BDI-2 Data Manager software was purchased from Riverside Publishing along with the assessment kit so that we could upload scores immediately via a wireless modem to their secure database. This minimized the possibility of sensitive data being seen by non-authorized personnel. Although the assessment coordinator's computer was both digitally and physically locked, he also deleted all sensitive information on the laptop once it was saved in an encrypted folder on our secure server and confirmed to be uploaded to the publishers secure site that is used by many states for their entire early intervention assessment process. Furthermore, using the publisher's database reduced human error because software guided the assessment while checking for errors and their remote database application calculated all results. We also created a spreadsheet that displayed the child's Z-scores along a normal curve so we could help the caregivers visualize the results more clearly. These spreadsheets were kept electronically in the same encrypted folder and in physical form behind two-locks as per IRB regulations.

   Once the consents, demographics, and pre-assessments were collected, data were entered into a proprietary database created by a database coordinator and me. We created a proprietary database using Filemaker Pro to meet our specific needs, enhance confidentiality, and produce specialized reports necessary for both our clinical and research needs. The database assigned the participants anonymous codes to be used on all further documents. The database included the following categories and information: 1) Participant Info - participant number, initials, start date, open and closed status,

birthday, home visitor, and data collection checklist; 2) Demo - all the demographic data collected; 3) Pre- and Post-BDI - the raw scores, Z-scores, Change Sensitive Scores, and testing comments; 4) Videos – all pre- and post- intervention videos were assigned to each participant. This database was checked for accuracy via built in redundancy and spot checks. At our weekly training and case review meetings, the home visitors would give our database manager that week's information, and she would produce a summary report to give back to them without identifying information. Thus, in combination with my random spot checks, the home visitors also had the opportunity to catch any mistakes. The home visitors brought the database manager new data each week, and she would lock the hardcopies in the secure filing cabinet in which only she and I had access.

2) The software was enormously helpful but had to be accessed remotely without compromising data and confidentiality. I worked with a data support specialist in the Center on Disability Studies to create a secure portal to the server that housed the RT software. He was able to create a system that met both The University of Hawai‘i and HIPAA data security guidelines. Furthermore, we did not keep any identifiable information in the RT database as all participants were labelled using the "dummy" coding system created by our more secure., proprietary database.
3) I was the primary contact for all problems or difficult situations that arose. The participants were given both my and the other Co-PI's names in the informed consent and instructed to contact us with any issues or concerns. Although I met almost all of them personally via the introductory, assessment, or service procedures, they were also given my card in their introductory packet and told to contact me at any time with any

concern. This was also true for my home visitors if they had concerns. We also worked in many difficult environments and were mandated reporters of abuse and neglect. I was the primary contact to determine whether we reported such cases although there were redundancies in place as can be seen by the emergency action plan shown below.

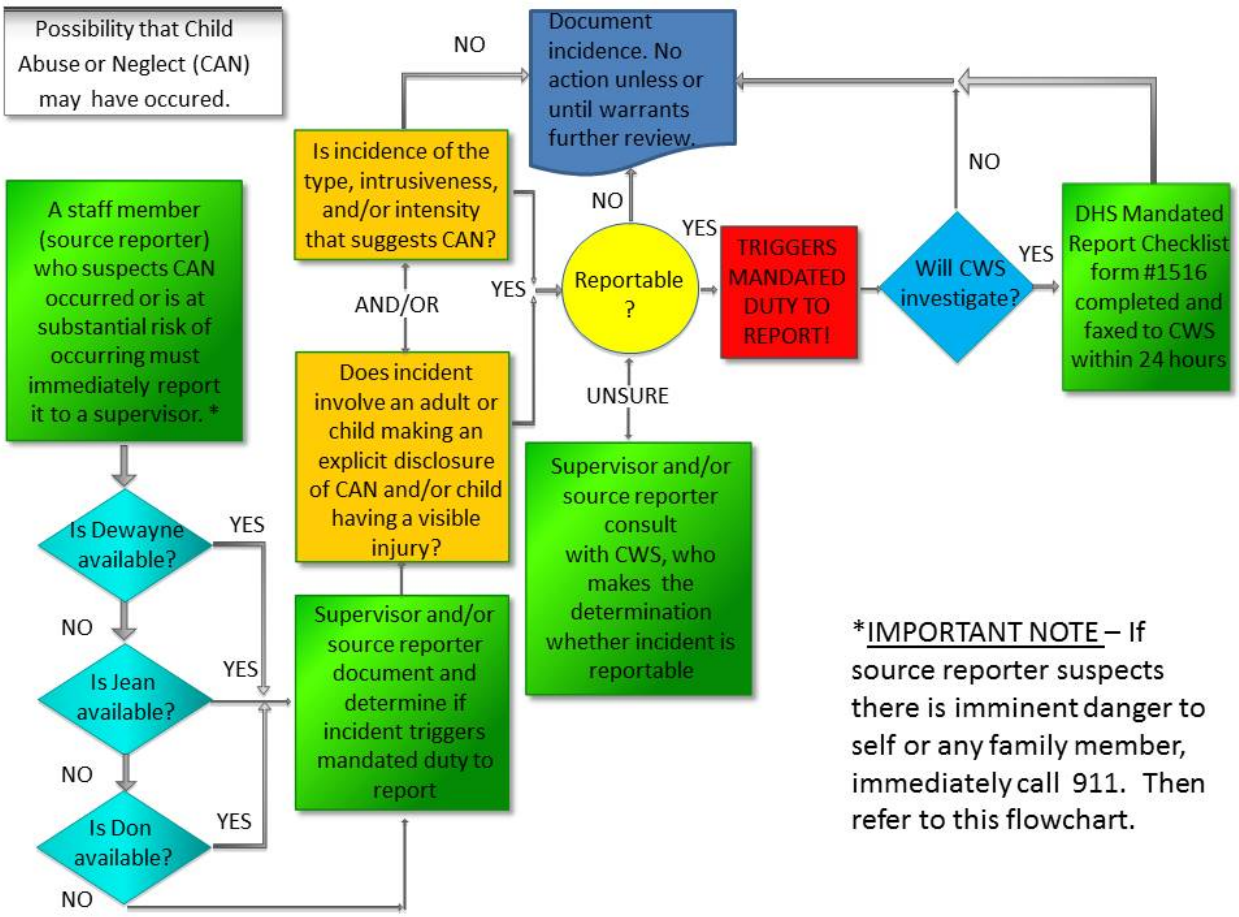


Figure 7. Flow Chart for Reporting Abuse and Neglect

Appendix G

Project Spirit Instructions for Preparing for and Documenting Sessions

Planning a Session: Please complete the following steps for each scheduled session:

1. Log into the RT website: http://spirit.manoa.hawaii.edu:8080/rtptp/Dispatcher?action=HOME

2. Under the *Planning* tab select *Plan and Print a New Session*.

- Select your participant in the *Participant ID* Box.

-Enter the *intervention date*. *(must be in 4 digit format)*

-Under *Location* please enter the type of place a session took place rather than the town. Examples of locations include home, park, beach, shelter, etc.

-From *Intervention Activity Box* select either*:*

a. *Responsive Teaching* – Use this selection for regular sessions (after a participant has signed a consent form) in which the RT program is used.

b. *Child or Family Assessment* – Use this selection if this session was mainly focused on administering an assessment, such as the BDI-2.

c. *Consultation* – Use this selection for any meetings with the family that take place before the family has given formal consent to participate in the program or if you meet with the parents when the child is not present.

3. For a regular RT session select *Responsiveness Teaching* and select the appropriate *Intervention Goal 1*, *Objective*, *Discussion Point* and *Instructional Strategy* for 1-3 goals.

4. When finished with session planning please print

- *Parent Session Plan*

- Professional Session Plan

- *Pivotal Behavior Profile*

*Option for Pivotal Behavior Profile (not mandatory): use different colors for different caregivers.

5. Give *Parent Session Plan* and Pivotal Behavior Profile to the parents along with your *Family Action Plan* for the week.

6. Please fill out the first two sections (issues and concerns and feedback) of the Professional Session Plan during the session and file in the chart along with session notes

Documenting a Session

1. Under the *Tracking* tab click *Comment on a Session*

- Select *Participant ID* and then the date of the scheduled session under *Session ID*.

2a. If the session was cancelled or you were unable to work on any RT goals select

"*NO*" under *Was the session held?*

- Even if a session was not held, please skip down to the comments section and write a note about why the session was not held.

  -If you spoke with the family note any important information was covered during the conversation and note the date the conversation occurred.

  -If a family was a "no show" write how long you waited for them and any follow phone messages/phone conversations you had with them (including the date).

- Print, Save and return

- Select a date to reschedule the session and save and print your comments

  *Note if there are duplicate sessions under the same note, you should delete one. See Cynthia if you have questions about this.

- You may file these comments yourself under Session Notes in your participant file (newest on top).

2b. If the session was held select "YES" under *Was the session held?* And fill out the rest of the page as follows:

- Enter the *start time* and *end time* with a total of 4 digits. (for example, 05:00 rather than 5:00)

- Rate the *Effectiveness of Caregivers* using the following standard:
  - *Not at All* – Parents report that they did not practice RT goals at all since the last session
  - *Made Some Effort* – Parent report occasional (2-3 times) practice of RT goals since last session.

  - *Highly Effective* – Parent report that they were engaged with the RT goals for a significant (more than half) number of days since the last session.
- Rate the *How Effective Was the Session* using the following standard:
  - *Not at All* – Parents are present but do not engage with the activities of the session.
  - *Made Some Effort* – Parents attempted to engage with the activities but did not understand or did not do the activities in the way you intended.
  - *Highly Effective* – Parents made an effort to engage with the activities and were effective in implementing them correctly.
- Rate the *Pivotal Behavior* using the standards listed under the *Pivotal Behavior Profile* for each goal selected.

- In the *Comments* section please write ***3 short paragraphs*** for the session note using the following **DAP** format:

  DESCRIBE the facts of the session

  - Note the parents mood/emotional state and level of engagement with you and with the session topic
  - who was present during the session and where the session was held.
  - Briefly describe what you did during the session including activities and goals worked on and any distractions or changes to the standard session.

  ASSESS the quality of the session

  - Note the parents mood/emotional state and level of engagement with you and with the session topic
  - Note the child's move/emotional state and level of engagement with his/her parent and with the session activity
  - Did the parents understand the topic? Did they "get it?"
  - Note any difficulties during the session and thoughts about why there were difficulties.

  PLAN for your next session while your thoughts are fresh

  - When did you plan the next session
  - Based on the thoughts you just wrote down, what do you think might be helpful to work on for the next session?

3. Save and print the *Session Comments.*

4. For each session please file these *Session Comments* along with the *Professional Session Plan* (comments on top) in the participant's chart.

Appendix H

Battelle Developmental Inventory™, Second Edition (BDI-2™) Summary

Authors:
Jean Newborg

Type:	Developmental assessment for early childhood
Purpose:	Screens and evaluates early childhood developmental milestones
Measures:	Personal-Social, Adaptive, Motor, Communication, and cognitive ability
Ages:	Birth to 7 years 11 months
Times:	Complete *BDI-2*: 60-90 minutes; Screening Test: 10-30 minutes
Scores:	PR, SS, AE, *T* score, Change Sensitive Score, and z score
Restriction Level:	Low; Examiner Qualifications
Funding Sources:	**Title I, IDEA, Early Childhood, Professional Development**

Overview

The **Battelle Developmental Inventory, Second Edition (BDI-2)** is an early childhood instrument based on the concepts of developmental milestones. As a child develops, he or she typically attains critical skills and behaviors sequentially from simple to complex. *BDI-2* helps measure a child's progress along this developmental continuum by both global domains and discrete skill sets. *BDI-2* is aligned to the three OSEP Early Childhood Outcomes, as well as the Head Start Child Outcomes. It can be used to meet the federal reporting requirements across Part C, Part B/619, and Head Start programs.

Uses

BDI-2 may be used by a team of professionals or by an individual service provider. Accommodations and modifications are available for professionals when assessing infants and children with special needs or disabilities.

Appropriate for all children ages birth to 7-11 years, BDI-2 is ideal for several uses:

- Screening of key developmental milestones for school readiness
- Assessing current developmental strengths and needs
- Measuring longitudinal growth of development
- Determining eligibility for special education services
- Evaluating children across various programs including preschool, daycare, early intervention, kindergarten, and Head Start
- Evaluating early childhood programs for accountability
- Assisting in development of Individualized Family Service Plans (IFSP) and Individualized Education Programs (IEP)

Below is a chart that maps the structure of the *BDI-2* domains and subdomains:

Adaptive Domain	Personal-Social Domain	Communication Domain	Motor Domain	Cognitive Domain
• Self-Care • Personal Responsibility	• Adult Interaction • Peer Interaction • Self-Concept and Social Role	• Receptive Communication • Expressive Communication	• Gross Motor • Fine Motor • Perceptual Motor	• Attention and Memory • Reasoning and Academic Skills • Perception and Concepts

Administration

BDI-2 administration is flexible and may begin in any of the five domains. The start point for each subdomain is clearly identified and is determined by the age or the estimated ability level for the child. Examiners proceed through each of the subdomains to determine the child's level of development. (See chart below for the structure of *BDI-2* domains and subdomains.) *BDI-2* items are child friendly and easy to administer. Based on the multifaceted information from Structured, Observational, and Interview items, *BDI-2* can be used by an individual or team of professionals to create a comprehensive picture of a child's skills. Structured items incorporate authentic, play-based activities. Observation items occur in the child's natural setting. Interview items help obtain parent, teacher or caregiver information about the child using an open-ended question format. Each Interview item is written in a "script" format. This "scripting" helps ensure administration consistency, but also allows the examiner flexibility to query where necessary to ensure sufficient information is gathered. More than one-third of the items may be administered using multiple sources of information. The item-scoring criteria are clear and efficient.

Kit Options

The *BDI-2* is now available in two formats to fit your assessment needs: (1) the traditional paper kit and (2) a new electronic kit (*e*Kit). The paper kit has the traditional item books with manipulatives and can be used with paper record forms. When the *BDI-2* Data Manager is included, a professional has access to a full assessment suite that provides quick scoring, detailed reporting, as well as data management for accountability at multiple levels. The *BDI-2 e*Kit replaces traditional item books with the Mobile Data Solution software, which contains all of the items from all five *BDI-2* domains, plus the screener items. It is used in conjunction with the *BDI-2* Data Manager to provide administration instructions and scoring on any windows based computer. The *e*Kit utilizes Electronic Record forms rather than paper record forms, and also can include the playful manipulatives used for the authentic assessment of an infant's or child's development.

The *e*Kit provides a streamlined administration process that can occur in any setting including the classroom or home environment. There is no need to be connected to the internet to administer the test.

Once internet is available, the Mobile Data Solution (MDS) software connects to the Data Manager for full reporting and scoring options. *e*Kit offers you a special software bundle that includes both the full *BDI-2* and screener assessments and everything you need to administer the assessment without any duplication.

Technical Qualities

Standardization

Normative data for the *BDI-2* were gathered from over 2500 children between the ages of Birth through 7 years, 11 months. The normative sample closely matches the 2000 U.S. Census (education level based on 2001 data). Bias reviews were conducted on all items for gender and ethnicity concerns. Item desirability information from examiners was also considered in the selection of the final items.

Reliability and Validity

Reliabilities for the *BDI-2* meet or exceed traditional standards for excellence at the subdomain, domain, and full test composite levels. Concurrent and criterion validity were obtained using the original *Battelle Developmental Inventory*; the *Bayley Scales of Infant Development,* Second Edition ; *Woodcock-Johnson® III; Denver Developmental Screening Test*, Second Edition; *Preschool Language Scale,* Fourth Edition; *Vineland Social-Emotional Early Childhood Scales;* and *Wechsler Preschool and Primary Scale of Intelligence,* Third Edition. All validity and reliability information is contained in the *Examiner's Manual*.

Appendix I

Maternal Behavior Rating Scale (Revised - 2008)

Gerald Mahoney

Note: The 12 Maternal Behavioral Scale Items assess four Interactive Style Factors (Boyce, Marfo, Mahoney, Spiker, Price & Taylor, 1996). The following organizes this scale according to the interactive factors they contribute to. Factor scores are computed by calculating the average (Mean) Likert ratings of all items on each factor. We recommend that this scale be used to assess the impact of intervention procedures on parent-child interaction (i.e., program evaluation). ***This scale should not be used in its current form for Evaluation or***

RESPONSIVE/CHILD ORIENTED

1. **SENSITIVITY TO CHILD'S INTEREST**.

This item examines the extent to which the parent seems aware of and understands the child's activity or play interests. This item is assessed by the parent's engaging in the child's choice of activity, parent's verbal comments in reference to child's interest and parent's visual monitoring of child's behavior or activity. Parents may be sensitive but not responsive - such as in situations where they describe the child's interests but do not follow or support them.

Rating of [1]: Highly insensitive. Parent appears to ignore child's show of interest. Parent rarely watches or comments on child's behavior and does not engage in child's choice of activity.

Rating of [2]: Low sensitivity. Parent occasionally shows interest in the child's behavior or activity. Parent may suddenly notice where child is looking or what child is touching but does not continue to monitor child's behavior or engage in activity.

Rating of [3]: Moderate sensitivity. Parent seems to be aware of the child's interests; consistently monitors child's behavior but ignores more subtle and hard-to-detect communications from the child.

Rating of [4]: High sensitivity. Parent seems to be aware of the child's interests; consistently monitors the child's behavior but is inconsistent in detecting more subtle and hard-to-detect communications from the child.

Rating of [5]: Very high sensitivity. Parent seems to be aware of the child's interests; The parent positions herself so that she can make face-to-face contact with the child. The parent consistently monitors the child's behavior and follows interest indicated by subtle and hard-to-detect communications from the child.

2. **RESPONSIVITY**.

This item rates the frequency, consistency and supportiveness of the parent's responses to the child's behaviors. Responses are supportive when they match the child's actions, requests and intentions. Responsivity is assessed in relation to child behaviors that both *demand a response* from adults as well as non-demand behaviors that may not be directed toward the adult. Child behaviors include play and social activity as well as facial expressions, vocalizations, gestures, signs of discomfort, body language, requests and intentions.

Rating of [1]: Highly unresponsive. Parent responds infrequently to the child and usually only to behaviors that demand a response. *Less than 10% of the tim*e the parent reacts to the child's play and social activities, facial expressions, vocalizations, gestures, body language, and intentions that do not demand a response.

Rating of [2]: Unresponsive. Parents respond to most of the child's demand behaviors but to *less than one fourth of the child's non-demand behaviors and intentions*. The parents' responses may be non-supportive in insofar as they stop the child's activity or redirect the child to do something different than what they were intending to do. They may also be mismatched to the child's behavior such as when parents label or comment on the child's activity but do physically react to the what the child is doing

Rating of [3]: Consistently responsive. Parents respond to almost all of the child's *demand behaviors and to at least one fourth of the child's non-demand behaviors* and intentions. Most of the parent's responses are supportive in insofar as they encourage the child's activity. *At least one half* of the parent's responses match the child's behavior such that the parent's responses are directly related to what the child is doing. For example, if the child is playing the parent responds with actions to the child's activity; if the child is vocalizing or communicating the parent responds by vocalizing or communicating. .

Rating of [4]: Responsive. Parents respond to almost all of the child's *demand behaviors and to about one half of the child's non-demand behaviors* and intentions. Most of the parent's responses are supportive in insofar as they encourage the child's activity. *Most* of the parent's responses match the child's behavior such that the parent's responses are directly related to what the child is doing. For example, if the child is playing the parent responds with actions to the child's activity; if the child is vocalizing or communicating the parent responds by vocalizing or communicating. .

Rating of [5]: Highly responsive. Parents respond to almost all of the child's *demand behaviors and to most of the child's non-demand behaviors* and intentions including subtle and hard to detect gestures, vocalizations and other behaviors. The parent's responses are almost always supportive in insofar as they encourage the child's activity. *The majority* of the parent's responses match the child's behavior such that the parent's responses are directly related to what the child is doing. For example, if the child is playing the parent responds with actions to the child's activity; if the child is vocalizing or communicating the parent responds by vocalizing or communicating. .

3. **EFFECTIVENESS (RECIPROCITY).**

This item refers to the parent's ability to engage the child in the play interaction. It determines the extent to which the parent is able to gain the child's attention, cooperation and participation in a *reciprocal* exchange characterized by balanced turntaking in play or conversation.

Rating of [1]: Very ineffective. Parent is seldom engaged in any kind of joint or cooperative activity or communication with the child. The child may be actively engaged and may even be in close proximity to the parent, but the parent is usually not joining in what the child is doing. The parent my attempt to elicit the child's cooperation, but the child either does not respond, or responds briefly and quickly disengages. Parent may give the appearance of helplessness where the child is concerned.

Rating of [2]: Ineffective. Parent is mostly ineffective in keeping the child engaged in joint or cooperative activity or communication. The child may be actively engaged and may even be in close proximity to the parent, but the parent is *only occasionally* successful at cooperating or participating with what the child is doing. In the few instances when the parent gains the child's cooperation, the interaction tends to last little more than two or three turns before the child disengages. In such instances, the child may continue the activity without noticing or responding to the parent

Rating of [3]: Moderately effective. At least one third of the time parent is successful in engaging the child in a joint activity or communication. Interactive sequences seldom last more than 3 to 5 turns before the child disengages, but such interactive sequences occur frequently during the observation. Interactive sequences may be dominated by either the parent or the child and are generally not characterized by a balanced reciprocal exchange of turns.

Rating of [4]: Highly effective. More than one half of the time parent is successful in engaging the child in a joint activity or communication. Interactive sequences generally last ten or more turns at a time. With little prompting the parent is successful at encouraging the child to transition into this pattern of interaction. The majority of interactive sequences are characterized by a balanced, reciprocal exchange of interactive turns.

Rating of [5]: Extremely effective. Parent is able to keep the child willingly engaged in joint activity or communication throughout the majority of the interaction. Interactive sequences generally last a few minutes at a time before the parent or child disengages. Interactive sequences are almost always characterized by a balanced, reciprocal exchange of turns.

AFFECT/ANIMATION

1. **ACCEPTANCE**

This item assesses the extent to which the parent's behaviors and communications accept or affirm the child and what the child is doing. Acceptance can range from rejection, to no or few signs of approval, to a more active affirmation as reflected in interactions that indicate that the child's behaviors and

communications are legitimate, good or worthy. Acceptance is measured primarily in terms of how parent's nonverbal and verbal behavior accept and affirm the child for who he or she is or what he or she is currently doing rather than for meeting the parent's requests or expectations.

Rating of [1]: Rejecting. Parent primarily interacts with the child by trying to get the child say or do things that the child does not appear capable of doing at the moment. Parent may express dissatisfaction with what the child is doing, and almost never takes delight in or encourages the child to communicate or play the way the child is able to do.

Rating of [2]: Low acceptance. Parent puts little pressure on the child to say or do things he is not yet able to do. However, parent shows little positive affect toward the child. Parent mostly remains neutral and almost never takes delight in or encourages the child to communicate or play the way the child is able to do.

Rating of [3]: Accepting. Parent expresses a general positive affect toward the child and occasionally expresses delight in child's actions or communications. While the parent affirms the child by frequently responding in a way that supports the child's actions or intentions, the parent also requests or prompts the child to do or say things that the child is unable to do.

Rating of [4]: Very accepting. Parent expresses enthusiasm and delight for the child's actions and communications. More than one half of the time, the parent's interacts in a way that affirms the child's actions and communications as legitimate and worthwhile. The parent may make a few suggestions or requests, but these are generally made to help the child communicate or do what they want more effectively.

Rating of [5]: High acceptance. Parent is effusive with delight and admiration of the child. Parent expresses intense positive affect in response to the child's actions and communications in a way that continually affirms the child as legitimate and worthwhile. The parent's suggestions or requests almost always support the child's actions and communications.

2. **ENJOYMENT.**

This item assesses the parent's enjoyment of interacting with the child. Enjoyment is experienced and expressed in response to the child himself -- his spontaneous expressions or reactions, or his behavior when interacting with his parent. There is enjoyment in child's being himself rather than the activity the child is pursuing.

Rating of [1]: Enjoyment is absent. Parent may appear rejecting of the child as a person.

Rating of [2]: Enjoyment is seldom manifested. Parent may be characterized by a certain woodenness. Parent does not seem to enjoy the child per se.

Rating of [3]: Pervasive enjoyment but low-intensity. Occasionally manifests delight in child being himself.

Rating of [4]: Enjoyment is the highlight of the interaction. Enjoyment occurs in the context of a warm relaxed atmosphere. Parent manifests delight fairly frequently.

Rating of [5]: High enjoyment. Parent is noted for the buoyancy and display of joy, pleasure, delighted surprise at the child's unexpected mastery.

3. **EXPRESSIVENESS**.

This item measures the tendency of the caregiver to communicate and react emotionally toward the child. It assesses both the frequency of the parent's verbal and nonverbal communications as well as well as the intensity and animation of these communications.

Rating of [1]: Highly inexpressive. Parent may be characterized as quiet and uncommunicative during the interaction. When the parent speaks, affect is flat; voice quality is dull and facial expressions vary little.

Rating of [2]: Low overt expressiveness. Parent communicates occasionally during the interaction. Parent's body language, affect, voice quality and facial expression may be characterized as dull to neutral

Rating of [3]: Moderate overt expressiveness. Parent communicates consistently during the interaction. Parent's body language, affect, voice quality and facial expression may be characterized as ranging from neutral to mildly positive.

Rating of [4]: Overtly expressive. Parent communicates consistently during the interaction. Parent uses body language, voice quality and facial expression in an animated manner to express emotion toward the child. Parent is generally enthusiastic but not extreme in expressiveness.

Rating of [5]: Highly expressive. Parent communicates consistently during the interaction. Parent is extreme in expression of all emotions using body language, facial expression and voice quality. Appears very animated, these parents are "gushers."

4. **INVENTIVENESS.**

This item assesses the range of stimulation parents provide their child; the number of different approaches and types of interactions and the ability to find different things to interest the child, different ways of using toys, combining the toys and inventing games with or without toys. Inventiveness is both directed toward and effective in maintaining the child's involvement in the situation. Inventiveness does not refer merely to a number of different, random behaviors, but rather to a variety of behaviors which are grouped together and directed towards the child.

Rating of [1]: Very small repertoire. Parent is unable to do almost anything with the child, parent seems at a loss for ideas, stumbles around, is unsure of what to do. Parent's actions are simple, stereotyped and repetitive.

Rating of [2]: Small repertoire. Parent does find a few ways to engage the child in the course of the situation, but these are of limited number and tend to be repeated frequently, possibly with long periods of inactivity. Parent uses the toys in some of the standard ways, but does not seem to use other possibilities with toys or free play.

Rating of [3]: Medium repertoire. Parent performs the normal playing behaviors of parenthood, shows ability to use the standard means of playing with toys, and the usual means of free play. Parent shows some innovativeness in play and use of toys.

Rating of [4]: Large repertoire. Parent shows ability to use all the usual playing behaviors of parenthood, but in addition is able to find uses which are especially appropriate to the situation and the child's momentary needs.

Rating of [5]: Very large repertoire. Parent consistently finds new ways to use toys and/or actions to play with the child. Parent shows both standard uses of toys as well as many unusual but appropriate uses, and is continually able to change his/her behavior in response to the child's needs and state.

5. **WARMTH.**

This item rates the demonstration of warmth to a child which is positive attitude revealed to the child through pats, lap-holding, caresses, kisses, hugs, tone of voice, and verbal endearments. Both the overt behavior of the parent and the quality of fondness conveyed are included in this rating. It examines positive affective expression; the frequency and quality of expression of positive feelings by the parent and the parent's show of affection.

Rating of [1]: Very low. Positive affect is lacking. Parent appears cold and reserved, rarely expresses affection through touch, voice.

Rating of [2]: Low. Parent occasionally expresses warmth through brief touches and vocal tone suggests low intensity of positive affect.

Rating of [3]: Moderate. Pervasive low-intensity positive affect is demonstrated throughout the interaction. Fondness is conveyed through touch and vocal tones.

Rating of [4]: High. Affection is expressed frequently through touch and vocal tone. Parent may verbalize terms of endearment.

Rating of [5]: Very high. Parent openly expresses love for the child continually and effusively through touch, vocal tone and verbal endearments.

ACHIEVEMENT ORIENTATION

1. **ACHIEVEMENT.**

This item is concerned with the parent's encouragement of sensorimotor and cognitive achievement. This item assesses the amount of stimulation by the parent, which is overtly oriented toward promoting the child's developmental progress. This item assesses the extent to which the parent fosters sensorimotor and cognitive development whether through play, instruction, training, or sensory stimulation and includes the energy which the parent exerts in striving to encourage the child's development.

Rating of [1]: Very little encouragement. Parent makes no attempt or effort to get child to learn.

Rating of [2]: Little encouragement. Parent makes a few mild attempts at fostering sensorimotor development in the child but the interaction is more oriented to play for the sake of playing rather than teaching.

Rating of [3]: Moderate encouragement. Parent continually encourages sensorimotor development of the child either through play or training but does not pressure the child to achieve.

Rating of [4]: Considerable encouragement. Parent exerts some pressure on the child toward sensorimotor achievement, whether as unilateral pressure or in a pleasurable interactional way and whether wittingly or unwittingly.

Rating of [5]: Very high encouragement. Parent exerts much pressure on the child to achieve. Parent constantly stimulates him toward sensorimotor development, whether through play or obvious training. It is obvious to the observer that it is very important to the parent that the child achieve certain skills.

2. **PRAISE (VERBAL)**

This scale assesses how much verbal praise is given to the child. Examples of verbal praise are "good boy," "that's a girl," "good job." Praise in the form of smiles, claps or other expressions of approval are not included unless accompanied by a verbal praise. Praise may be given for compliance, achievement or for the child being himself.

Rating of [1]: Very low praise. Verbal praise is not used by the parents in the interaction even in situations which would normally elicit praise from the parent.

Rating of [2]: Low praise. Parent uses verbal praise infrequently throughout the interaction.

Rating of [3]: Moderate praise. Parent uses an average amount of verbal praise during the interaction. Parent praises in most situations which would normally elicit praise.

Rating of [4]: Praises frequently. Parent verbally praises the child frequently for behavior which would not normally elicit praise.

Rating of [5]: Very high praise. Very high frequency of verbal praise from the parent even for behavior which would not normally elicit praise.

DIRECTIVE

1. **DIRECTIVENESS**

This item measures the frequency and intensity in which the parent requests, commands, hints or attempts in other manners to direct the child's immediate behavior.

> **Rating of [1]: Very low directive**. Parent allows child to initiate or continue activities of his own choosing without interfering. Parent consistently avoids volunteering suggestions and tends to withhold them when they are requested or when they are the obvious reaction to the immediate situation. Parent's attitude may be "do it your own way."
>
> **Rating of 2: Low directive**. Parent occasionally makes suggestions. This parent rarely tells the child what to do. He/she may respond with advice and criticism when help is requested but in general refrains from initiating such interaction. On the whole, this parent is cooperative and non-interfering.
>
> **Rating of [3]: Moderately directive**. The parent's tendency to make suggestions and direct the child is about equal to the tendency to allow the child self-direction. The parent may try to influence the child's choice of activity but allow him independence in the execution of his play, or he may let the child make his own choice but be ready with suggestions for effective implementation.
>
> **Rating of [4]: Very directive**. Parent occasionally withholds suggestions nut more often indicates what to do next or how to do it. Parent produces a steady stream of suggestive remarks and may initiate a new activity when there has been no previous sign of inertia and/or resistance shown by the child.
>
> **Rating of [5]: Extremely directive**. Parent continually attempts to direct the minute details of the child's "free" play. This parent is conspicuous for the extreme frequency of interruption of the child's activity-in-progress, so that the parent seems "at" the child most of the time -- instructing, training, eliciting, directing, controlling.

2. **PACE**.

This item examines the parent's rate of behavior. The parent's pace is assessed apart from the child's; it is not rated by assessing the extent to which it matches the child's pace but as it appears separately from the child.

> **Rating of [1]: Very slow.** Parent is almost inactive. Pace is very slow with long periods of inactivity.

Rating of [2]: Slow. Parent's overall tempo is slower than average. There may be inconsistency in the parents' tempo in which periods of inactivity are followed by occasions of active participation.

Rating of [3]: Average pace. This parent is neither strikingly slow nor fast. Tempo appears average compared to other parents.

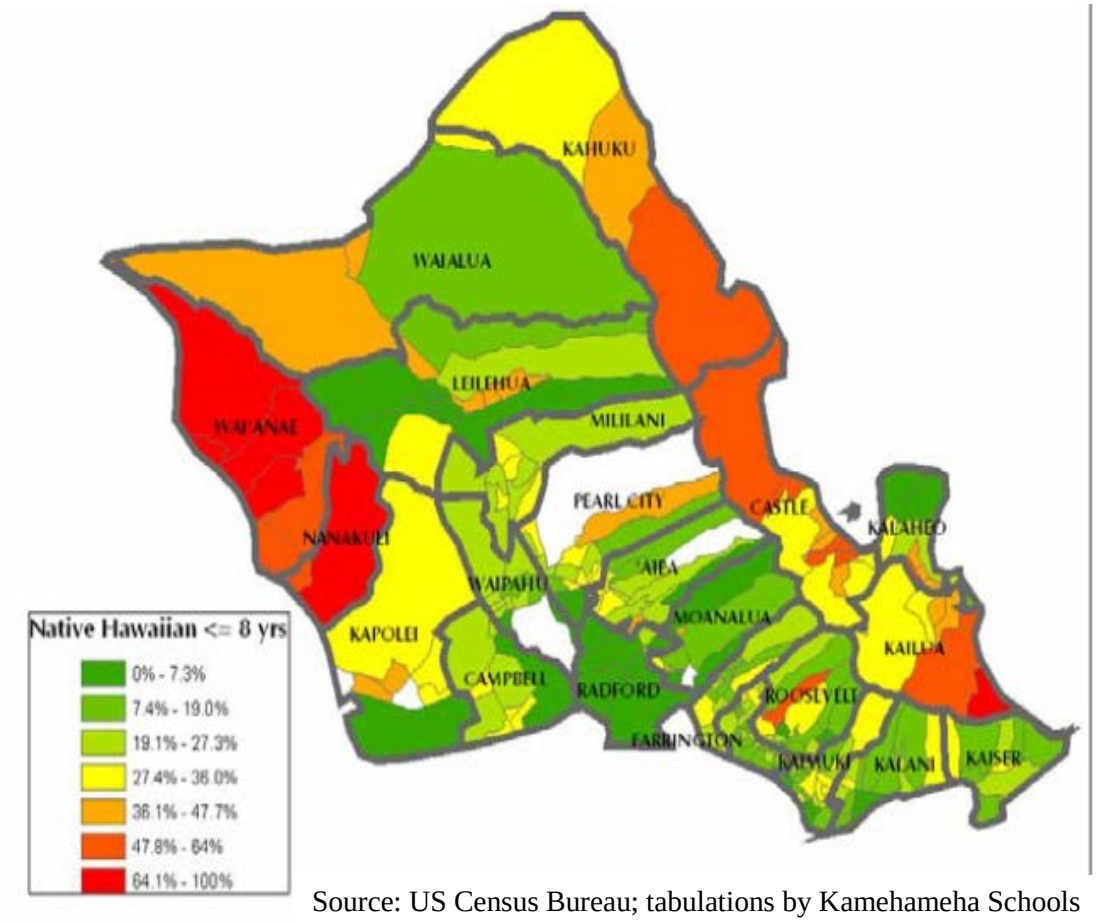
Rating of [4]: Fast. Parent's overall tempo is faster than average. There may be few brief periods of inactivity, that re followed by quick paced activity.

Rating of [5]: Very fast. Parent's interactive tempo could be characterized as rapid fire behavior. The pace of the parent's interactive tempo may not allow the child time to react.

SCORING MBRS ITEM	Observation 1 Date _____	Observation 2 Date _____	Observation 3 Date _____	Observation 4 Date _____
RESPONSIVE/CHILD ORIENTED				
1. Sensitivity				
2. Responsivity				
3. Effectiveness				
Scale Score (Sen + Res + Eff)/3				
AFFECT/ANIMATION				
1. Acceptance				
2. Enjoyment				
3. Expressiveness				
4. Inventiveness				
5. Warmth				
Scale Score (Acc + Enj + Exp + Inv + War)5				
ACHIEVEMENT ORIENTATION				
1. Achievement				
2. Praise				
Scale Score (Ach + Pra)/2				
DIRECTIVE				
1. Directiveness				
2. Pace				
Scale Score (Dir + Pac)/2				
Comments:				

Appendix J

Community Profiles



Source: US Census Bureau; tabulations by Kamehameha Schools Research & Evaluation

Figure 8. The Concentrations of Native Hawaiian children under the age of 8.

Table 12: Community Profiles of At-Risk Factors to Children and Families

Waianae	Median age of only 29.2, the fourth lowest in the State, has almost 31,000 residents and includes the neighborhoods of Wai‘anae, Ma‘ili, Makaha, Makua, Ka‘ena, and Ulu Wehi. The proportion of young people from birth to age 19 is one of the highest in the State. Ethnic makeup – high percentages of multi-racial, Other Pacific Islander, Hawaiian, and Part-Hawaiian residents. The Wai‘anae area ranks poorly on many measures of child and family well-being, including unemployment, per capita income, children in poverty, child abuse rates, and school safety. More than 60% of adolescents in this community report neighborhood fights, graffiti, drugs, and crime. There are high levels of disability and

	unmet health needs. Other areas of concern are the poor performance of 3rd graders on the math and reading SAT, tests, teacher turnover, school attendance, low levels of college acceptance, and the high percentage of youths not in school or working.
Nānākuli	This small community of about 11,400 residents on the Leeward Coast of O'ahu covers Nānākuli, Lualualei and parts of Kahe. Approximately 40% of the population here is under the age of 20, the second youngest in the State. The ethnic makeup of the Nānākuli Area is unique. It consists of one of the highest concentrations of Native Hawaiian and Part–Hawaiian residents. Nānākuli ranks poorly on many measures of child and family well-being. The percentage of unemployed persons is more than double the State average, and per capita income is the 2nd lowest in the State. Almost half of families here receive food stamps; the area is ranked 4th highest in the State for Temporary Assistance to Needy Families recipients. Almost 70% of the adolescents from this community report neighborhood problems with fighting, graffiti, and crimes. Child abuse rates are high, and teachers' and parents' reports of school safety are among the lowest in the State. Third-graders do poorly on their SAT tests, and fewer adults in this community have a high school diploma or college degree than in most other communities.
Waimānalo	Waimānalo has been identified as one of several priority areas in which to expand services for young Native Hawaiian children (ages zero to eight). The Native Hawaiian population accounted for 5,843 out of the 10,161 residents of Waimānalo, which is approximately six out of every ten people in the community (57.5 percent). Within the area of Waimänalo is a Department of Hawaiian Home Lands Homestead, which is governed by its Homestead Association. 72% of Native Hawaiian students in Grade 8 report "community disorganization." Unemployment is 2 points higher than state average. Consultation with an array of community members revealed the following issues to be of primary importance relative to child well-being and education: substance abuse prevention; school readiness and transitions; and, awareness of services. 45.2 percent of children under 3 and 4 are enrolled in a nursery or preschool. 41.1% of children belong to single parent households. 71.1% of children under 8 are at least partially Native Hawaiian. In school year 2005–06, 827 Native Hawaiian children attended public schools (K–12) in the area, fully 72.4 percent of all public school students, which far exceeded the statewide proportion of Native Hawaiians in public schools (26 percent). On standardized reading tests, a higher percentage of Native Hawaiian children in Grade 3 in Waimänalo scored below average (24.6 percent) than the statewide public school Native Hawaiian average among third-graders (23.4 percent). Significantly lower percentage (2.9%) of Native Hawaiian Waimānalo 3rd graders scored "above average" than did all Native Hawaiian students statewide (15.3 percent). The same trends are evidenced among Native Hawaiian third-graders in Waimänalo in mathematics, although the differences are smaller.

Source: Kamehameha Schools, 2009a

Appendix K

Example Reference Letter showing Partner Support

Child & Family Service

Private, nonprofit since 1899

April15,2014

Jean Johnson, Dr PH, Principal Investigator
Center on Disability Studies
University of Hawaii at Manoa
1410 Lower Campus Road
Honolulu, HI 96822

Dear Dr. Johnson:

It is a pleasure to write this letter of support for your application for funding of *Project SPIRIT*
through the Native Hawaiian Education Act.

Child & Family Service (CFS) focuses on helping children avoid neglect or abuse or recover accord- ingly so they reach their full potential. We welcome effective programs that help parents develop healthy attachments and responsive interactions with their infants and toddlers, preventing abuse or neglect and the need for these families to come to the attention of CFS.

The staff of Child & Family Service is well aware of the work done by Project SPIRIT over the past three years, working with very high-risk families along the Waianae Coast and in Waimanalo. We applaud the project for the positive outcomes it has produced for many children and families. We appreciate the support of the project staff in assisting CFS with participants in the past as several of our workers have referred families over the past three years and will continue to do so.

While we wish the prevention programs in the community were truly sufficient to prevent child abuse and neglect, we know CFS will likely continue to see families in need of extra services. CFS would welcome Project SPIRIT as a community resource for referral of these families to improve their understanding of child development and to provide opportunities to learn how to interact most effectively for the development of their children.

Best wishes with your application and be assured that CFS would welcome this needed resource to our community.

Sincerely,

Howard S. Garval, MSW
President & Chief Executive Officer

Appendix L

Procedures for Establishing Interrater Reliability on the MBRS

Gerald Mahoney, Ph.D
December, 2009

I try to establish interrater reliability by having the raters (if there is more than 1 rater) become reliable with a "reliability person". If there are more than 2 raters, I never ask that all raters are reliable with each other. That is very difficult to attain. Normally it takes about 50 hours of training to get to acceptable levels of reliability.

If you have two ratings on the same child (Time 1 and Time 2), make sure that all ratings for a child are done by the same person, since raters always have slight differences in the way they rate the items. Also it is very important that the raters do not have a personal relationship with the parent or child they are rating.

To establish reliability, we watch a tape together, rate the tape, and then discuss why we rated the tape the way we did. We normally do this for 5 to 10 tapes to the point where the raters feel they understand the rating criteria for each item.

Then each of the raters begins to rate tapes independently. I usually do this initially with 5 tapes at a time. At that point, I compare raters' reliability using the SPSS crosstabs program - which can help to show percent agreement, Pearson r and Cohen's Kappa if you want. (Note, I do not like Cohen's kappa, but that is my own preference). I look for 100% agreement within one point and 80% exact agreement across all items. I also check the mean and distribution of each coder's ratings. It is important that the raters are using all 5 points on the Likert scale. Some raters have a tendency to only use Likert ratings of 2, 3, or 4 which artificially truncates the scale. I tell the raters that I would expect that most of the items are normally distributed (the majority of scores are 3, a lesser amount are 2 or 4, and an even lesser number of the ratings are 1 and 5.

This rule does not always make sense. For example, after the parents have been trained to be responsive, we would expect that most parents might have high responsive ratings.

After independently rating each group of 5 tapes and doing the crosstabs analysis, I have the raters review the tapes together and discuss why they rated the way they did.

Raters need to understand that their job is to come to agreement about how to rate each item. They need to read the criteria carefully, and occasionally modify the criteria slightly if it will help them achieve agreement. We often have lengthy discussions about how to rate various items. Some raters do not work out because they are unwilling to come to agreement with the other raters.

Once the raters have overall Pearson Rs that are .75 or higher, I have the raters rate another ten tapes independently, from which I report their initial interrater reliabilities. If they are not reliable at this point we go back through the training procedure.

After we have established initial reliability, I then do reliability checks on anywhere between 10 to 20% of the rater's observations. I suggest that one rater is used for reliability only and the other rater(s) is used for coding the observational data. Sometimes we get drift on our reliability checks, at which point we go back to a training mode.

I recommend that the observations that are rated last a minimum of 3 minutes to a maximum of 7 minutes. They do not all have to be exactly the same length, but they do need to be the same general type of observation (e.g., play with the same set of toys for all children). Generally, the longer the observation the more difficult it is to get reliability.

The way we enter data for compute reliability statistics is as follows:

Var 1 SubjectID

Var 2 MBRS Item (1-12)

Var 3 Observer 1 (rating for the item)

Var 4 Observer 2 (rating for the item)

Then run crosstabs (SPSS) rater1 by rater2

Or rater1 by rater2 by MBRS item.

If you need moiré information contact Gerald Mahoney at gjm14@case.edu

Appendix M

Demographics

Section 1: Demographics of the 44 participants who completed the program

Family Composition

	Frequency	Percent	Valid Percent	Cumulative Percent
1	10	22.7	22.7	22.7
2	30	68.2	68.2	90.9
3	4	9.1	9.1	100.0
Total	44	100.0	100.0	

Legend
1 = Single Parent Household
2 = Two parent Household
3 = Other (i.e., resource caregiver, grandparent)

Combined Household Income

	Frequency	Percent	Valid Percent	Cumulative Percent
1	15	34.1	34.1	34.1
2	8	18.2	18.2	52.3
3	3	6.8	6.8	59.1
4	7	15.9	15.9	75.0
5	3	6.8	6.8	81.8
6	2	4.5	4.5	86.4
7	3	6.8	6.8	93.2
8	3	6.8	6.8	100.0
Total	44	100.0	100.0	

Legend (In USD)
1 = > 9,999
2 = 10,000 – 19,999
3 = 20,000 – 29,999
4 = 30,000 – 39,999
5 = 40,000 – 49,999
6 = 50,000 – 59,999
7 = 60,000 – 69,999
8 = < 70,000

Age of Father

		Frequency	Percent	Valid Percent	Cumulative Percent
	1	17	38.6	43.6	43.6
	2	16	36.4	41.0	84.6
	3	3	6.8	7.7	92.3
	4	2	4.5	5.1	97.4
	5	1	2.3	2.6	100.0
	Total	39	88.6	100.0	
Missing		5	11.4		
Total		44	100.0		

Legend (in Years)
0 = > 18
1 = 18 – 29
2 = 30 - 39
3 = 40 – 49
4 = 50 – 59
5 = 60 – 69
6 = 70 – 79

Age of Mother

	Frequency	Percent	Valid Percent	Cumulative Percent
1	22	50.0	52.4	52.4
2	14	31.8	33.3	85.7
3	4	9.1	9.5	95.2
4	2	4.5	4.8	100.0
Total	42	95.5	100.0	
Missing	2	4.5		
Total	44	100.0		

Legend (in Years)
0 = > 18
1 = 18 – 29
2 = 30 - 39
3 = 40 – 49
4 = 50 – 59
5 = 60 – 69
6 = 70 – 79

Age of other Caregiver

	Frequency	Percent	Valid Percent	Cumulative Percent
2	1	2.3	14.3	14.3
3	1	2.3	14.3	28.6
4	4	9.1	57.1	85.7
6	1	2.3	14.3	100.0
Total	7	15.9	100.0	
Missing	37	84.1		
Total	44	100.0		

Legend (in Years)
0 = > 18
1 = 18 – 29
2 = 30 - 39
3 = 40 – 49
4 = 50 – 59
5 = 60 – 69
6 = 70 – 79

Educational Level of Father

	Frequency	Percent	Valid Percent	Cumulative Percent
0	3	6.8	7.7	7.7
1	21	47.7	53.8	61.5
2	8	18.2	20.5	82.1
3	1	2.3	2.6	84.6
4	5	11.4	12.8	97.4
5	1	2.3	2.6	100.0
Total	39	88.6	100.0	
Missing	5	11.4		
Total	44	100.0		

Legend
0 = > High School Diploma
1 = High School Diploma
2 = Some College/No Degree
3 = Associates Degree
4 = Bachelor's Degree
5 = Master's Degree

Educational Level of Mother

	Frequency	Percent	Valid Percent	Cumulative Percent
0	5	11.4	11.9	11.9
1	16	36.4	38.1	50.0
2	10	22.7	23.8	73.8
3	5	11.4	11.9	85.7
4	4	9.1	9.5	95.2
5	2	4.5	4.8	100.0
Total	42	95.5	100.0	
Missing	2	4.5		
Total	44	100.0		

Legend
0 = > High School Diploma
1 = High School Diploma
2 = Some College/No Degree
3 = Associates Degree
4 = Bachelor's Degree
5 = Master's Degree

Educational Level of Other Caregiver

	Frequency	Percent	Valid Percent	Cumulative Percent
0	2	4.5	33.3	33.3
1	2	4.5	33.3	66.7
2	2	4.5	33.3	100.0
Total	6	13.6	100.0	
Missing	38	86.4		
Total	44	100.0		

Legend
0 = > High School Diploma
1 = High School Diploma
2 = Some College/No Degree
3 = Associates Degree
4 = Bachelor's Degree

Section 2: Demographics of all 70 "Dropouts" (all who did not complete)

Family Composition

	Frequency	Percent	Valid Percent	Cumulative Percent
1	14	20.0	25.0	25.0
2	36	51.4	64.3	89.3
3	6	8.6	10.7	100.0
Total	56	80.0	100.0	
Missing	14	20.0		
Total	70	100.0		

Legend
1 = Single Parent Household
2 = Two parent Household
3 = Other (i.e., resource caregiver, grandparent)

Combined Household Income

	Frequency	Percent	Valid Percent	Cumulative Percent
1	20	28.6	37.0	37.0
2	12	17.1	22.2	59.3
3	7	10.0	13.0	72.2
4	6	8.6	11.1	83.3
6	1	1.4	1.9	85.2
7	3	4.3	5.6	90.7
8	5	7.1	9.3	100.0
Total	54	77.1	100.0	
Missing	16	22.9		
Total	70	100.0		

Legend (In USD)
1 = > 9,999
2 = 10,000 – 19,999
3 = 20,000 – 29,999
4 = 30,000 – 39,999

Age of Father

	Frequency	Percent	Valid Percent	Cumulative Percent
1	23	32.9	51.1	51.1
2	13	18.6	28.9	80.0
3	9	12.9	20.0	100.0
Total	45	64.3	100.0	
Missing	25	35.7		
Total	70	100.0		

Legend (in Years)
0 = > 18
1 = 18 – 29
2 = 30 - 39
3 = 40 – 49
4 = 50 – 59
5 = 60 – 69
6 = 70 – 79

Age of Mother

	Frequency	Percent	Valid Percent	Cumulative Percent
0	2	2.9	3.9	3.9
1	28	40.0	54.9	58.8
2	17	24.3	33.3	92.2
3	4	5.7	7.8	100.0
Total	51	72.9	100.0	
Missing	19	27.1		
Total	70	100.0		

Legend (in Years)
0 = > 18
1 = 18 – 29
2 = 30 - 39
3 = 40 – 49
4 = 50 – 59
5 = 60 – 69
6 = 70 – 79

Age of other Caregiver

	Frequency	Percent	Valid Percent	Cumulative Percent
1	3	4.3	37.5	37.5
4	4	5.7	50.0	87.5
6	1	1.4	12.5	100.0
Total	8	11.4	100.0	
Missing	62	88.6		
Total	70	100.0		

Legend (in Years)
0 = > 18
1 = 18 – 29
2 = 30 - 39
3 = 40 – 49
4 = 50 – 59
5 = 60 – 69
6 = 70 – 79

Educational Level of Father

	Frequency	Percent	Valid Percent	Cumulative Percent
0	6	8.6	13.3	13.3
1	25	35.7	55.6	68.9
2	10	14.3	22.2	91.1
3	1	1.4	2.2	93.3
5	3	4.3	6.7	100.0
Total	45	64.3	100.0	
Missing	25	35.7		
Total	70	100.0		

Legend
0 = > High School Diploma
1 = High School Diploma
2 = Some College/No Degree
3 = Associates Degree
4 = Bachelor's Degree
5 = Master's Degree

Educational Level of Mother

	Frequency	Percent	Valid Percent	Cumulative Percent
0	8	11.4	15.7	15.7
1	17	24.3	33.3	49.0
2	16	22.9	31.4	80.4
3	4	5.7	7.8	88.2
4	4	5.7	7.8	96.1
5	2	2.9	3.9	100.0
Total	51	72.9	100.0	
Missing	19	27.1		
Total	70	100.0		

Legend
0 = > High School Diploma
1 = High School Diploma
2 = Some College/No Degree
3 = Associates Degree
4 = Bachelor's Degree
5 = Master's Degree

Educational Level of Other Caregiver

	Frequency	Percent	Valid Percent	Cumulative Percent
1	6	8.6	75.0	75.0
2	1	1.4	12.5	87.5
4	1	1.4	12.5	100.0
Total	8	11.4	100.0	
Missing	62	88.6		
Total	70	100.0		

Legend
0 = > High School Diploma
1 = High School Diploma
2 = Some College/No Degree
3 = Associates Degree
4 = Bachelor's Degree
5 = Master's Degree

Section 3: Demographics of the 26 "Engaged Dropouts" (over 3 session + all Pre-assessments)

Family Composition

	Frequency	Percent	Valid Percent	Cumulative Percent
1	8	30.8	32.0	32.0
2	14	53.8	56.0	88.0
3	3	11.5	12.0	100.0
Total	25	96.2	100.0	
Missing	1	3.8		
Total	26	100.0		

Legend
1 = Single Parent Household
2 = Two parent Household
3 = Other (i.e., resource caregiver, grandparent)

Combined Household Income

	Frequency	Percent	Valid Percent	Cumulative Percent
1	10	38.5	40.0	40.0
2	7	26.9	28.0	68.0
3	2	7.7	8.0	76.0
4	2	7.7	8.0	84.0
7	2	7.7	8.0	92.0
8	2	7.7	8.0	100.0
Total	25	96.2	100.0	
Missing	1	3.8		
Total	26	100.0		

Legend (In USD)
1 = > 9,999
2 = 10,000 – 19,999
3 = 20,000 – 29,999
4 = 30,000 – 39,999
5 = 40,000 – 49,999
6 = 50,000 – 59,999
7 = 60,000 – 69,999
8 = < 70,000

Age of Father

	Frequency	Percent	Valid Percent	Cumulative Percent
1	9	34.6	50.0	50.0
2	6	23.1	33.3	83.3
3	3	11.5	16.7	100.0
Total	18	69.2	100.0	
Missing	8	30.8		
Total	26	100.0		

Legend (in Years)
0 = > 18
1 = 18 – 29
2 = 30 - 39
3 = 40 – 49
4 = 50 – 59
5 = 60 – 69
6 = 70 – 79

Age of Mother

	Frequency	Percent	Valid Percent	Cumulative Percent
1	11	42.3	47.8	47.8
2	10	38.5	43.5	91.3
3	2	7.7	8.7	100.0
Total	23	88.5	100.0	
Missing	3	11.5		
Total	26	100.0		

Legend (in Years)
0 = > 18
1 = 18 – 29
2 = 30 - 39
3 = 40 – 49
4 = 50 – 59
5 = 60 – 69
6 = 70 – 79

Age of other Caregiver

	Frequency	Percent	Valid Percent	Cumulative Percent
1	2	7.7	50.0	50.0
4	2	7.7	50.0	100.0
Total	4	15.4	100.0	
Missing	22	84.6		
Total	26	100.0		

Legend (in Years)
0 = > 18
1 = 18 – 29
2 = 30 - 39
3 = 40 – 49
4 = 50 – 59
5 = 60 – 69
6 = 70 – 79

Educational Level of Father

	Frequency	Percent	Valid Percent	Cumulative Percent
0	2	7.7	11.1	11.1
1	11	42.3	61.1	72.2
2	3	11.5	16.7	88.9
3	1	3.8	5.6	94.4
5	1	3.8	5.6	100.0
Total	18	69.2	100.0	
Missing	8	30.8		
Total	26	100.0		

Legend
0 = > High School Diploma
1 = High School Diploma
2 = Some College/No Degree
3 = Associates Degree
4 = Bachelor's Degree
5 = Master's Degree

Educational Level of Mother

	Frequency	Percent	Valid Percent	Cumulative Percent
0	2	7.7	8.7	8.7
1	14	53.8	60.9	69.6
2	4	15.4	17.4	87.0
3	1	3.8	4.3	91.3
4	2	7.7	8.7	100.0
Total	23	88.5	100.0	
Missing	3	11.5		
Total	26	100.0		

Legend
0 = > High School Diploma
1 = High School Diploma
2 = Some College/No Degree
3 = Associates Degree
4 = Bachelor's Degree
5 = Master's Degree

Educational Level of Other Caregiver

	Frequency	Percent	Valid Percent	Cumulative Percent
1	4	15.4	100.0	100.0
Missing	22	84.6		
Total	26	100.0		

Legend
0 = > High School Diploma
1 = High School Diploma
2 = Some College/No Degree
3 = Associates Degree
4 = Bachelor's Degree
5 = Master's Degree

BDI-2 (Pre) Results

	n	Min	Max	Mean	SD
Chronological Age at BDI	26	7.0	48.0	28.231	12.7069
BDI Total CSS	26	419.00	532.00	483.1923	32.86459
BDI Total Z Score	26	-.73	1.93	.7481	.89279
Cognitive CSS	26	426.00	528.00	481.0000	31.36240
Cognitive Z Score	26	-1.33	2.40	.3254	.97001
Comm CSS	26	393.0	542.0	482.500	44.2143
Comm Z Score	26	-1.40	2.20	.7588	1.08225
Personal-Social CSS	26	457.00	527.00	488.8077	22.45354
Personal-Social Z Score	26	-1.53	3.00	.7358	1.16403